Karyotype EKB Questions.

Q1: In a human ovum, which of the following chromosomes is larger in size than chromosome number 8?

A 23

B 21

C 22

D None of the answers are correct

Q2: Which of the following represents the correct sequence of the formation of a human embryo?

A Fertilization ⟶ mitosis ⟶ meiosis

B Fertilization ⟶ meiosis ⟶ mitosis

C Mitosis ⟶ fertilization ⟶ meiosis

D Meiosis ⟶ fertilization ⟶ mitosis

Q3: Which of the following statements correctly describes both the sperm and the ovum?

A Unlike somatic cells which contain autosomes, the sperm and the ovum are sex cells which contain a single pair of either X or Y chromosomes.

B The sperm and the ovum are gametes, which contain the same number of autosomes found in somatic cells, but each of them contains half the number of sex chromosomes found in the somatic cells.

C The sperm and the ovum are haploid cells containing 22 autosomes and one sex chromosome responsible for sex determination; both cells are involved in sexual reproduction.

D The sperm and the ovum are haploid cells containing 23 pairs of chromosomes, which is half the number of chromosomes found in the somatic cells.

Q4: Which of the following cells contains an odd number of chromosomes?

A The muscle cells of birds

B The kidney cells of mammals

C A plant ovum (egg cell)

D The nerve cells of a reptile

E A human skin cell

Q5: Assume that chromosome segregation did not take place properly during the formation of a human ovum. The karyotype of the resulting ovum is 23, O. If this ovum was fertilized by a normal sperm, which of the following statements would be correct?

A The number of chromosomes in the zygote would be 46.

B The number of autosomes in the zygote would not equal the normal number of autosomes in humans.

C The ratio between the number of chromosomes in the zygote and the gametes would be 2: 1.

D All the answers are correct.

Q6: Which of the following best defines a diploid cell?

A A cell that contains one copy of each chromosome

B A cell that divides to form four identical daughter cells

C A cell that contains two copies of each chromosome

D A cell that contains two copies of each pair of homologous chromosomes

Q7: The majority of human chromosomes are known as autosomes. How many chromosomes in a human karyotype of a somatic (body) cell are sex chromosomes?

_____ **Chromosomes**

Q8: In humans, which of the following is considered the 8th chromosome in terms of size?

A Chromosome X

B Chromosome 8

C Chromosome Y

D Chromosome 7

Q9: A passage about the use of karyotypes is provided, with two key terms removed.

Karyotypes arrange the chromosomes present in an organism into homologous pairs, in size order. Geneticists can analyze karyotypes to identify any genetic---------------- ,for instance, an individual having three copies of a ------------------------ instead of the normal pair, which could lead to diseases or developmental problems.

- **Which word would be most appropriate to replace the first blank?**

A Abnormalities

B Consistencies

C Tendencies

D Expressions

➢ **Which word would be most appropriate to replace the second blank?**

A Allele

B Chromatid

C Chromosome

D Nucleus

Q10: Chromosomes are arranged in homologous pairs in the nucleus of eukaryotic cells. What is meant by the term *homologous pairs*?

A Pairs of chromosomes that contain the same alleles

B Pairs of chromosomes that are of a similar length and that have a similar gene positioning

C Pairs of chromosomes that are inherited from one parent

D Pairs of chromosomes that code for the same characteristic in different organisms

Q11: All of the following cells must have all their chromosomes in homologous pairs except .

A muscle cells from the uterus

B the female zygote of *Drosophila*

C liver cells from a man

D brain cells from a woman

Q12: A carrot has 9 chromosomes in a haploid cell. How many chromosomes will a diploid body cell from this organism contain?

Chromosomes

Q13: How many chromosomes should appear in a karyotype of a human diploid body cell?

[ ] **Chromosomes**

Q14: Which of the following words describes sex chromosomes in human males?

A Symmetric

B Non homologous

C Inconsistent

D Irregular

Q15: In a test cross between a human female and a human male producing normal gametes, what is the chance of their offspring being male or female?

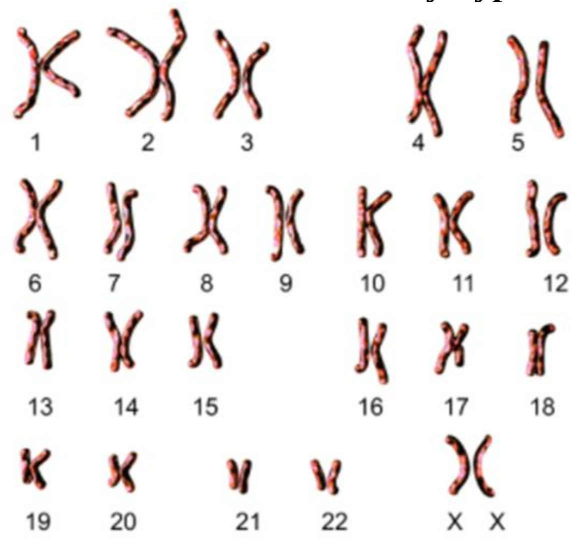
A It is always 50%.

B It depends on the surrounding temperature during pregnancy.

C There is a 70% chance to be a female if born before 9 months of pregnancy.

D None of the answers are correct.

Q16: The diagram provided shows a karyotype, which is used to view the chromosomes in an organism. How are chromosomes 1–22 ordered in a karyotype?



A By the number of genes they contain and in matching pairs

B By decreasing size and in random pairs

C By decreasing size and in homologous pairs

D By increasing size and in matching pairs

Q17: Which of the following cells does not contain an even number of chromosomes?

A *Drosophila* nerve cell

B Cat muscle cell

C Human liver cell

D None of the answers are correct

Q18: Which of the following statements is true?

A Somatic cells and gametes are both haploid and produced by meiosis, but somatic cells have two sex chromosomes and gametes have only one.

B Somatic cells and gametes are both diploid, however, they are produced by mitosis and meiosis respectively.

C Somatic cells are haploid and produced by mitosis, while gametes are diploid and produced also by mitosis.

D Somatic cells are diploid and produced by mitosis, while gametes are haploid and produced by meiosis.

Q19: Which of the following best defines a haploid cell?

A A cell that has two copies of each chromosome

B A cell that divides to form two identical daughter cells

C A cell that contains two copies of each pair of homologous chromosomes

D A cell that only has one copy of each chromosome

Q20: Which of the following is larger than chromosome 8 but not arranged according to its size?

A Chromosome 23

B Chromosome Y

C Chromosome 7

D Chromosome X

Q21: A human ovum contains 24 chromosomes. It is fertilized by a sperm cell with the normal number of chromosomes. Which of the following is true about the zygote that will develop?

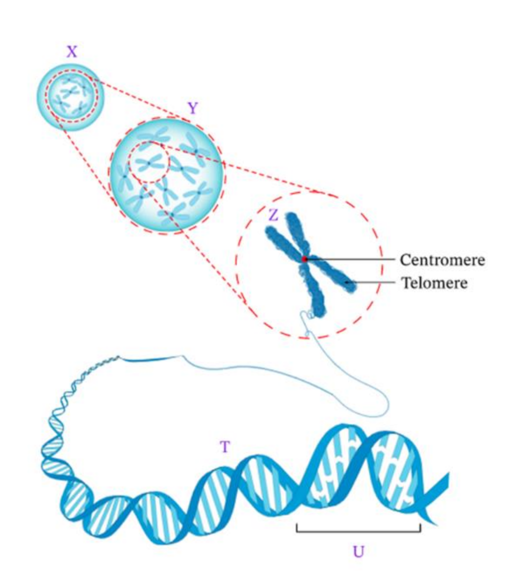
A The zygote will fail to develop into an embyro.

B The cells of the zygote will contain one too many chromosomes.

C The cells of the zygote will contain the normal number of chromosomes, but they will not pair correctly.

D The cells of the zygote will contain an additional pair of chromosomes.

Q22: The diagram provided shows the organization of genetic material in a cell. Which letter identifies the chromosome in the diagram?



A Z

B T

C U

D X

E Y

Q23: Which of the following best describes the term *chromosome*?

A A threadlike structure of tightly coiled DNA that contains many genes

B An alternative form of a gene

C A tightly coiled section of DNA that codes for a particular protein

D A protein that DNA wraps around to increase its stability

Q24: A cat has 38 chromosomes in a diploid body cell. How many chromosomes will a haploid cell from this organism contain?

[ ] **Chromosomes**

Q25: Let us assume that the SRY gene, which is responsible for the formation of testes and for preventing the development of female reproductive structures, was deleted from chromosome Y during gametogenesis. If the sperm carrying this Y chromosome fertilises a normal ovum, which of the following is most likely to be correct in this case?

A The baby would be male with a genotype of XY.
B The baby would be female with a genotype of XY.
C The baby would be male with a genotype of XO.
D The baby would be female with a genotype of XO.

Guide Answer:

1	A	11	C	21	B
2	D	12	18	22	A
3	C	13	46	23	A
4	C	14	B	24	19
5	D	15	A	25	B
6	C	16	C		
7	2	17	D		
8	A	18	D		
9	A,C	19	D		
10	B	20	D		

Q1: In a species of pea plants, the allele for green pods is dominant to that for yellow pods.

The diagram provided shows two parent pea plants being crossed.

What is the probability, in percent, that the offspring will have a green pod?

Phenotype:	Green pod	Yellow pod
Genotype:	Gg	gg
Gametes:	? ?	? ?

%

Q2: Gregor Mendel bred a population of pea plants and recorded the results of the crosses. He determined that 5 474 of the seeds produced by the offspring were smooth and 1 850 were wrinkled.
What percentage of the total offspring displayed the dominant trait? Give your answer to the nearest whole number.

%

Q3: Which of the following is **not** a difference between any two normal non-twin brothers?

A The proteins which are coded for and produced depending on their genes

B The sequence of DNA molecules in their chromosomes

C The number of their chromosomes

D The alleles of genes found on each of their chromosomes

Q4: In a species of pea plants, the allele for smooth seeds is dominant to the allele for wrinkled seeds.

The diagram provided shows two parent pea plants being crossed. What is the probability, in percent, that the offspring will have wrinkled seeds?

Phenotype:	Smooth seed	Wrinkled seed
Genotype:	WW	ww
Gametes:	? ?	? ?

Answer %

Q5: Genes carry the code for proteins which are responsible for the appearance of genetic traits. Let's assume that the DNA sequence of a gene is changed leading to a change in its protein. The genetic trait controlled by this gene will .

A stay the same

B be duplicated

C be altered

D be blended with another trait

Q6: If crossed with a green, wrinkled, seeded pea plant, which of the following genotypes will give all possible phenotypes distributed equally in their offspring?

A YySS

B YySs

C Yyss

D yySs

Q7: Which of the following Punnett squares shows the correct inheritance of sex in humans?

A

	Female Gametes	
Male Gametes	x	x
x	xx	xy
y	xx	xy

C

	Female Gametes	
Male Gametes	x	y
x	xx	xy
y	xy	yy

B

	Female Gametes	
Male Gametes	x	y
x	xx	xy
x	xx	xy

D

	Female Gametes	
Male Gametes	x	x
x	xx	xx
y	xy	xy

Q8: In a monohybrid cross, it was found that a quarter of the offspring has a different phenotype than that of the parents. If the mother and the father have the same phenotype, deduce the genotypes of the parents.

A The father and the mother have two dominant alleles each.

B Both the father and the mother have one dominant allele and one recessive allele.

C The mother has two recessive alleles and the father has one dominant allele and one recessive allele.

D The father has two dominant alleles and the mother has one dominant allele and one recessive allele.

Q9: In a species of a pea plant, the allele for green pods is dominant to that for yellow pods. The diagram provided shows two parent pea plants being crossed. Which of the following Punnet squares shows the correct cross?

Phenotype:	Green pod	Green pod
Genotype:	G g	G g
Gametes	G g	G g

A

	G	G
g	G g	G g
g	G g	G g

B

	G	g
g	G g	g g
g	G g	g g

C

	G	g
G	G G	G g
g	G g	g g

Q10: Choose the correct statement regarding the chromosomal theory from the following.

A Only sex chromosomes are found as homologous pairs in somatic cells and gametes.
B The segregation of each pair of chromosomes into gametes is independent.
C After the fertilisation of somatic cells, half of the number of chromosomes is lost to be $2n$.
D Chromosomes are found in gametes as homologous pairs.

Q11: An F1 generation of plants was produced by cross-pollination to give four plants with round seeds.

An F2 generation of the four plants was produced by the self-pollination of a single plant of the F1 generation. Three plants of the F2 generation showed the dominant trait of round seeds and one plant showed the recessive trait of wrinkled seeds.

Determine the genotypes of the parents of the F1 generation. Use R as the allele for round seeds and r as the allele for wrinkled seeds.

A rr and rr
B It is not possible to determine the genotypes.
C RR and RR
D RR and rr

Q12: Gregor Mendel investigated the inheritance of genes through breeding experiments using his pea plants. From these experiments, he produced three laws of inheritance. Which of the following best explains Mendel's law of independent assortment?

A Alleles on separate chromosomes will not interact with each other in offspring.
B Genes that are responsible for different characteristics will be inherited independently of each other.
C A gamete of an organism will carry only one allele for each gene.
D The combination of alleles in the offspring will be dependent on the combination of alleles in the parents.

Q13: Mendel studied the inheritance of 7 traits in pea plants and did not come across any sort of linkage. Which one of Mendel's laws of inheritance would have been completely different if Mendel observed linkage between these genes?

A The law of segregation of genetic factors
B The law of complete dominance
C The law of independent assortment
D None of the answers are correct.

Q14: In a species of pea plants, the allele for smooth seeds is dominant to the allele for wrinkled seeds. The diagram provided shows two parent pea plants being crossed. Which of the following Punnett squares shows the correct cross?

Phenotype:	Smooth seed	Wrinkled seed
Genotype:	WW	ww
Gametes:	? ?	? ?

A

	W	w
W	WW	Ww
W	WW	Ww

B

	W	W
w	Ww	Ww
w	Ww	Ww

C

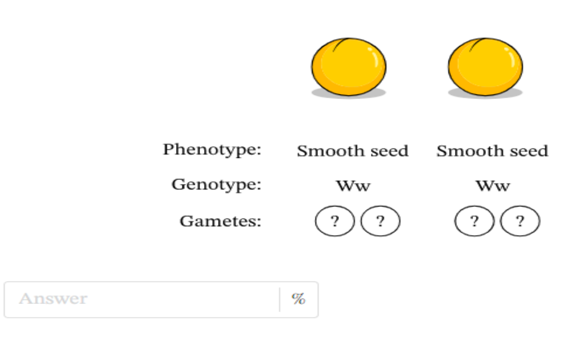
	W	w
w	Ww	ww
w	Ww	ww

D

	W	w
W	WW	Ww
w	Ww	ww

Q15: In a species of pea plants, the allele for smooth seeds is dominant to the allele for wrinkled seeds. The diagram provided shows two parent pea plants being crossed.

What is the probability, in percent, that the offspring will have wrinkled seeds?



Q16: State the phenotypic ratio (dominant to recessive) for the Punnett square provided.

	W	w
w	Ww	ww
w	Ww	ww

A 3:1

B 1:3

C 2:2

D 0:4

Q17: A pea plant with a tall stem can have the genotype TT or Tt, whereas a plant with a short stem will have the genotype tt.

A tall pea plant is crossed with a short plant to produce 4 offspring. Which of the following outcomes would indicate that the tall plant had the genotype TT?

A All of the offspring have stems that are halfway between the tall and short plants.

B 3 out of 4 of the offspring have tall stems.

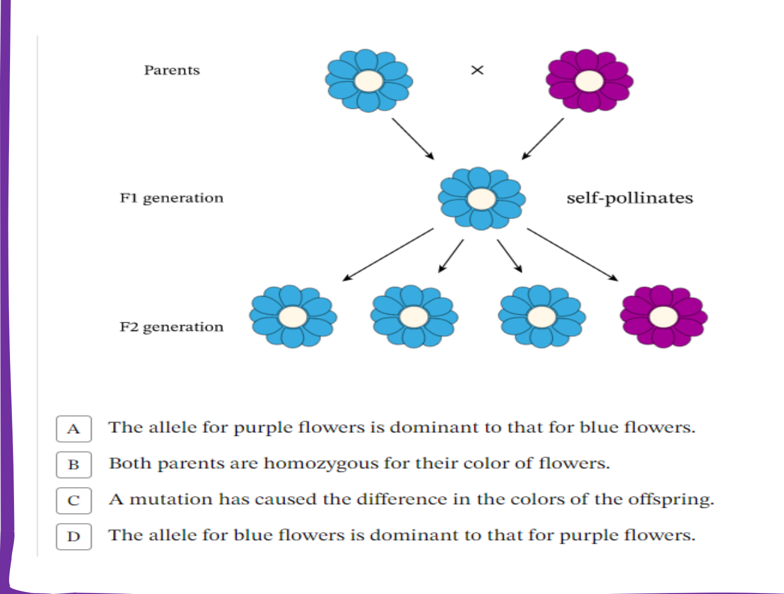
C None of the offspring have tall stems.

D All of the offspring have tall stems.

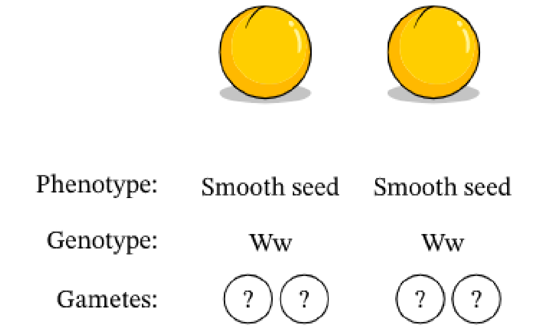
E 50% of the offspring have short stems.

Q18: The diagram provided shows a simple summary of the offspring produced when a plant with blue flowers reproduces with a plant with purple flowers.

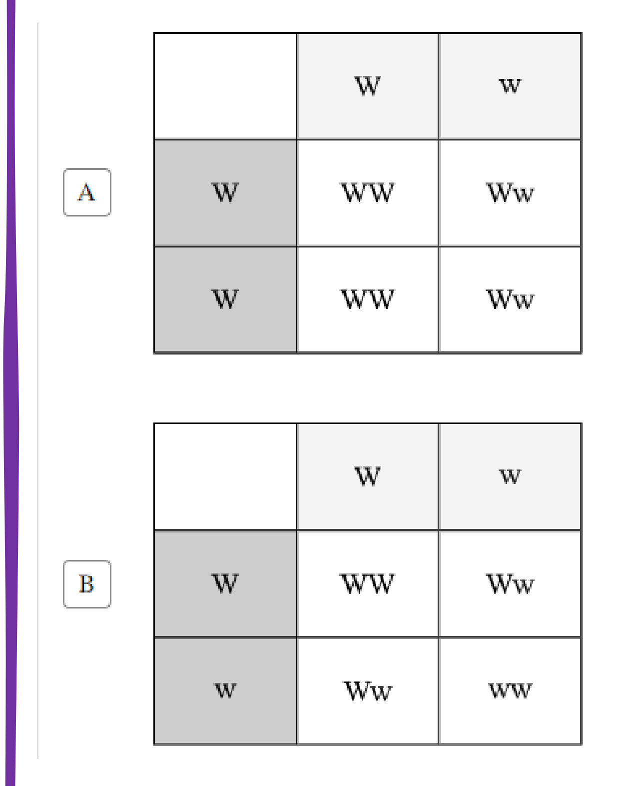
What can be assumed about the traits shown by these flowers?

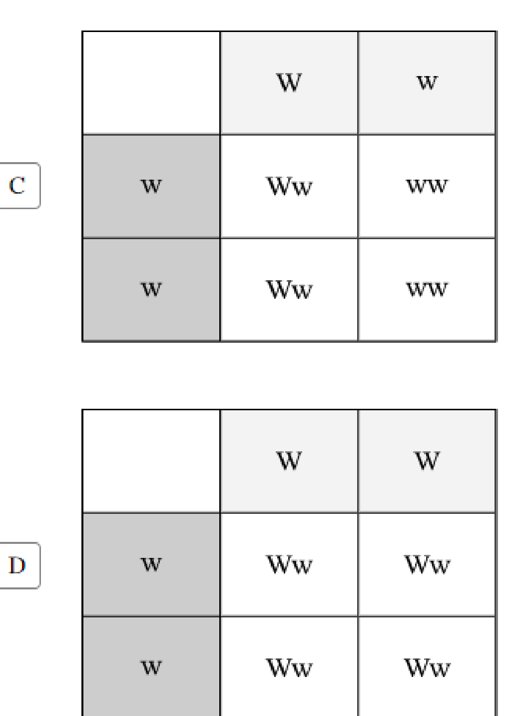


Q19: In a species of pea plants, the allele for smooth seeds is dominant to the allele for wrinkled seeds. The diagram provided shows two parent pea plants being crossed.



Which of the following Punnett squares shows the correct cross?

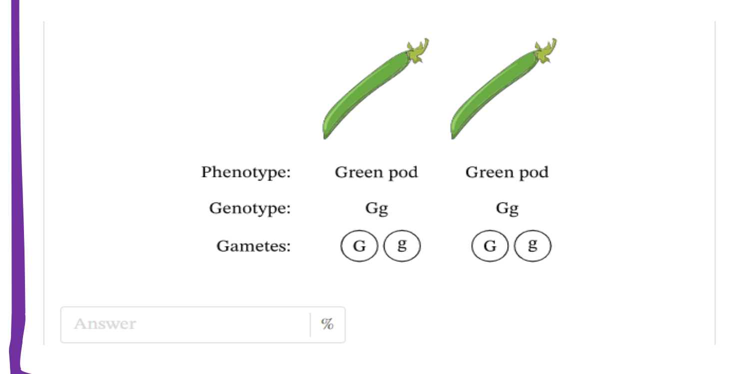




Q20: In a species of pea plants, the allele for green pods is dominant to that for yellow pods.

The diagram provided shows two parent pea plants being crossed.

What is the probability, in percent, that the offspring will have a yellow pod?



Q21: State the phenotypic ratio (dominant to recessive) for the Punnett square provided.

	G	G
g	Gg	Gg
g	Gg	Gg

A 0:4
B 4:0
C 2:2
D 3:1

Q22: Which of the following correctly describes the relationship between chromosomes and genes?

A There are many genes located on a single chromosome.
B There are many chromosomes within one gene.

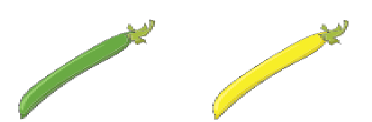
Q23: Gregor Mendel investigated the inheritance of genes through breeding experiments using his pea plants. From these experiments, he produced three laws of inheritance. Which of the following best explains Mendel's law of segregation?

A The alleles for a gene are kept at separate positions on a chromosome.
B A gamete of an organism will carry only one allele for each gene.
C When gametes combine in fertilization, the alleles for each gene will come from one parent only.
D A gamete of an organism will carry only two alleles for each gene.

Q24: In a species of pea plants, the allele for green pods is dominant to that for yellow pods.

The diagram provided shows two parent pea plants being crossed.

Which of the following Punnett squares shows the correct cross?



Phenotype:	Green pod	Yellow pod
Genotype:	Gg	gg
Gametes:	? ?	? ?

A

	G	g
G	GG	Gg
g	Gg	gg

B

	G	g
g	Gg	gg
g	Gg	gg

C

	G	G
g	Gg	Gg
g	Gg	Gg

Q25: State the phenotypic ratio (dominant to recessive) for the Punnett square provided.

	G	g
G	GG	Gg
g	Gg	gg

A 3 : 1

B 2 : 1

C 1 : 3

D 4 : 0

Guide Answer:

1	50	11	D	21	B
2	75	12	B	22	A
3	C	13	C	23	B
4	0	14	B	24	B
5	C	15	25	25	A
6	B	16	C		
7	D	17	D		
8	B	18	D		
9	C	19	B		
10	B	20	25		

Q1: Cystic fibrosis is an inherited disorder caused by a recessive allele. Which of the following best explains what this means?

A A person must have two copies of the allele for cystic fibrosis to be expressed in the phenotype.

B Cystic fibrosis only affects offspring once every two generations.

C A person can carry more than one copy of the allele and not have cystic fibrosis.

D A person must have three copies of the allele for cystic fibrosis to be expressed in the phenotype.

E A person will express the disease in their phenotype even if only one allele is in their genotype.

Q2: Polydactyly is an inherited disorder, and in most cases, it is caused by a dominant allele (D). This Punnett square shows the genotypes of a male and a female and the predicted genotypes for their offspring. What is the missing genotype?

Father	Mother	
	d	d
D	Dd	Dd
d	...	dd

A DD

B dd

C Dd

Q3: Tay-Sachs is an inherited disease caused by a recessive allele (t). The Punnett square shows the genotypes of a male and a female and the predicted genotypes for their offspring. What is the missing genotype?

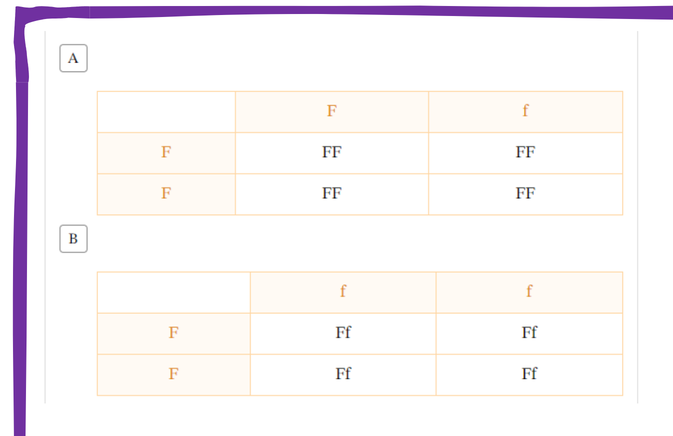
Father	Mother	
	T	t
T	TT	...
t	Tt	tt

A tt

B Tt

C TT

Q4: A person who is heterozygous for the cystic fibrosis allele (Ff) reproduces with a person who is homozygous dominant (FF). Which of the Punnett squares shows the correct cross?



A

	F	f
F	FF	FF
F	FF	FF

B

	f	f
F	Ff	Ff
F	Ff	Ff

C

	F	f
F	FF	Ff
F	FF	Ff

D

	F	F
F	FF	FF
f	ff	ff

Q5: Duchenne muscular dystrophy is a sex-linked disorder that is characterized by progressive muscle degeneration and weakness in the body. It is caused by recessive alleles carried on the X chromosome.

Which of the following best explains why males are more likely to suffer from this disorder than females?

A Males only have one X chromosome, so a recessive allele on that chromosome will be expressed.
B The X chromosome is smaller than the Y chromosome, so alleles on the X chromosome are more likely to be expressed.
C Males have two Y chromosomes, so a recessive allele will be expressed if there are two copies on each chromosome.
D The chromosomes in males develop slower than those in females, so males are more likely to inherit disorders.

Assume the allele for Duchenne muscular dystrophy is d. What is the genotype of a female carrier?

A X^dY
B X^DX^d
C X^DX^D
D X^DY
E X^dX^d

Assume the allele for Duchenne muscular dystrophy is d. What is the genotype of a female who is homozygous dominant for this allele?

A X^DY
B X^DX^d
C X^dX^d
D X^dY
E X^DX^D

Assume the allele for Duchenne muscular dystrophy is d. What is the genotype of a male sufferer?

A X^dY
B X^DY
C X^dX^d
D X^DX^D
E X^DX^d

Q6: Huntington's disease is a neurological disease caused by a dominant allele. What does this mean?

A Huntington's disease will be expressed in the phenotype even when only one copy of the dominant allele is present.
B There is a 100% chance that all children born to a parent with the allele for Huntington's disease will inherit it.
C Huntington's disease is more likely to be inherited by the firstborn child than any other child.
D Huntington's disease requires two copies of the dominant allele to be present to be expressed in the phenotype of a person.
E There is always a 75% chance of inheriting Huntington's disease if one parent has the dominant allele.

Q7: The pedigree chart provided shows the inheritance of color blindness in a family.

C A B
Unaffected female Carrier female Affected male Unaffected male

How many members of this family will be color blind?

The couple A and B are having a child. What is the probability that their child will be color blind?

%

The couple A and B are having a child. What is the probability that their child will be a carrier of the color-blindness allele?

[ ] %

Assume the allele for color blindness is b. What is the genotype of individual C?

A X^BX^B
B X^BY
C X^bX^b
D X^BX^b

Q8: Tay-Sachs is an inherited disease caused by a recessive allele (t). The Punnett square shows the genotypes of a male and a female and the predicted genotypes for their offspring. What is the probability, in percent, that a child born to these parents will inherit Tay-Sachs disease?

Father	Mother	
	T	t
T	TT	Tt
t	Tt	tt

Answer %

Q9: Huntington's disease is caused by a dominant allele (H). A heterozygous male reproduces with a homozygous recessive female.

What is the genotype of the heterozygous male?

A HH
B Hh
C hh

What is the probability that a child of this couple will inherit Huntington's disease? Use a Punnett square.

[ ] %

Which of the following best explains why there are no carriers for diseases caused by dominant alleles, such as Huntington's?

A The combination of alleles does not allow any offspring to be heterozygous.
B If a person is heterozygous for the allele, they will express it in their phenotype.
C If a person is heterozygous for the allele, they will not express it in their phenotype.
D If a person has the allele, they will not survive to pass it on to their offspring.

Q10: The genes for yellow-coloured fur in mice and chlorophyll absence in corn are examples of inherited lethal genes. All of the following statements are correct about the two types of lethal genes except ---------------.

A all yellow mice and all green corn seedlings should be heterozygous to survive

B recessive lethal genes can only cause death in the homozygous state

C when crossing two heterozygotes which carry lethal genes in both corn plants and yellow mice, 100% of white corn seedlings die, whereas only 1/3 of yellow mice in the offspring do not survive

D when crossing two heterozygotes which carry lethal genes in both corn plants and yellow mice, both types of lethal genes showed lethality (loss) ratio in the offspring of 1 dead : 3 viable

Q11: Huntington's disease is an inherited disease caused by a dominant allele (H). The Punnett square provided shows the genotypes of a male and a female and the predicted genotypes for their offspring. What is the probability, in percent, that a child born to these parents would inherit Huntington's disease?

Father	Mother	
	H	h
h	Hh	hh
h	Hh	hh

Answer %

Q12: A geneticist is studying a case of a lethal gene by performing test crosses. He would be able to deduce that the lethality is due to the combined effect of two dominant alleles if the phenotypic ratio was -------------------.

A 1:2:1

B 3:1

C 3:0

D 2:1

Q13: A child with infantile dementia (Tay–Sachs disease) was born and died in his early childhood. Which of the following represents the genotypes of his parents?

A Aa X AA

B Aa X Aa

C AA X aa

D Aa X aa

Q14: Huntington's disease is an inherited disease caused by a dominant allele (H). The Punnett square shows the genotypes of a male and a female and the predicted genotypes for their offspring. What is the missing genotype?

Mother		
Father	H	h
h	...	hh
h	Hh	hh

A hh

B HH

C Hh

Q15: Huntington's diseases is caused by a dominant allele. Which of the following best describes what this means?

A A person must have more than one copy of the allele for the disease to be expressed in their phenotype.

B A person will express the disease in their phenotype even if only one allele is in their genotype.

Q16: Cystic fibrosis is an inherited disease caused by a recessive allele (f). The Punnett square shows the genotypes of a male and a female and the predicted genotypes for their offspring. What is the missing genotype?

Father	Mother	
	F	F
F	FF	FF
f	Ff	...

A Ff

B ff

C FF

Q17: Cystic fibrosis is an inherited disease caused by a recessive allele (f). Use this partially completed Punnett square, which shows the genotypes of a male and a female, to predict the probability, in percent, that a child born to these parents would be a carrier for the cystic fibrosis allele.

Father	Mother	
	F	f
F		
f		

Answer %

Q18: When mating occurs between a homozygous male mouse with yellow fur and a female mouse with grey fur, the ratio of their offspring would be -----------------.

A 100% yellow mice
B 1 yellow mouse : 1 grey mouse
C 3 yellow mice : 1 grey mouse
D This mating cannot take place.

Q19: Polydactyly is an inherited disorder, and in most cases, it is caused by a dominant allele (D). Use this partially completed Punnett square, which shows the genotypes of a male and a female, to predict the probability, in percent, that a child born to these parents would inherit polydactyly.

Father	Mother	
	d	d
D		
d		

Answer %

Q20: If a boy inherited one allele of infantile dementia (Tay–Sachs disease) from one of his parents, the boy will show symptoms of the disease because ----------------.

A he is a male
B this trait is a sex-linked trait that can only be carried by the X chromosome
C his mother is homozygous
D The statment is incorrect as the boy should not show symptoms of the disease.

Q21: Two plants which have hybrid chlorophyll traits were mated together, and all the offspring were germinated in a darkroom. How would the ratio of green seedlings to yellow seedlings be?

A 100% yellow seedlings
B 1:3
C 100% green seedlings
D 3:1

Q22: Polydactyly is caused by a dominant allele.

A female heterozygous for polydactyly reproduces with a heterozygous male. What is the probability that the offspring will have polydactyly?

[ ] %

A male heterozygous for polydactyly reproduces with a female who is homozygous recessive. What is the probability that the offspring will have polydactyly?

[ ] %

Q23: PKU is an inherited disorder caused by a recessive allele (r). A male who is homozygous for the disorder reproduces with a heterozygous female.

What is the genotype of the male homozygous for PKU?

A rr
B Rr
C RR

What is the genotype of the female heterozygous for PKU?

A rr
B RR
C Rr

What is the probability that a child of theirs will inherit the disorder PKU?

[ ] %

What is the probability that a child of theirs will be a carrier of the PKU allele?

[ ] %

Q24: In which of the following cases of lethal genes could mating take place between two individuals with different phenotypes?

A Recessive lethal genes
B Dominant lethal genes
C Both dominant and recessive lethal genes
D None of the answers are correct.

Q25: Cystic fibrosis is an inherited disease caused by a recessive allele (f). The Punnett square shows the genotypes of a male and a female and the predicted genotypes for their offspring. What is the probability, in percent, that a child born to these parents will be a carrier for the cystic fibrosis allele?

Father	Mother	
	F	F
F	FF	FF
f	Ff	Ff

Answer %

Guide Answer:

1	A	11	50	21	A
2	B	12	D	22	75,50
3	B	13	B	23	A,C,50,50
4	C	14	C	24	B
5	A,B,E,A	15	B	25	50
6	A	16	A		
7	2,0,50,D	17	50		
8	25	18	D		
9	B,50,B	19	50		
10	A	20	D		

Q1: Assume that in plants, seed shape and color are determined by two different genes, outlined in the table provided.

Seed Shape Alleles	R (round)	r (wrinkled)
Seed Color Alleles	G (green)	g (yellow)

In a plant that has the genotype RrGg, what combination of alleles can be produced in the gametes?

A Rg, Gr

B Rg, gR, rg, GR

C RG, Rg, rG, rg

D RG, rg

Q2: Assume that in plants, seed shape and color are determined by two different genes, as outlined in the table provided.

Seed Shape Alleles	R (round)	r (wrinkled)
Seed Color Alleles	G (green)	g (yellow)

In a plant that has the genotype rrGg, what combination of alleles can be produced in the gametes?

A rg only

B Rg only

C rG, rg

D RG, rg

Q3: Assume that in flies, body color and the size of wings are determined by two different genes, as outlined in the table provided.

Body Color Alleles	G (gray)	g (black)
Wing Size Alleles	N (normal)	n (small/vestigial)

In a fly that has the genotype ggNN, what combination of alleles can be produced in the gametes?

A gg, NN

B GN only

C gN only

D GN, gN

Q4: Assume that in guinea pigs, the allele for black fur (B) is dominant to white fur (b), and the allele for smooth fur (F) is dominant to the allele for rough fur (f).

Which of the following Punnet squares correctly crosses two guinea pigs that are heterozygous for both traits?

A

	BF	Bf	bF	bf
BF	BBFF	BBFf	BbFF	BbFf
Bf	BBFf	BBff	BbFf	Bbff
bF	BbFF	BbFf	bbFF	bbFf
bf	BbFf	Bbff	bbFf	bbff

C

	BF	Bf	bF	bf
BF	BBFF	BBFF	BBFF	BBFF
Bf	BBFf	BBFf	BBFf	BBff
bF	BBFF	BBFF	bbFF	bbFF
bf	BBFF	BBff	bbFF	bbff

B

	B	b	F	f
B	BB	Bb	BF	Bf
b	Bb	bb	bF	bf
F	BF	bF	FF	Ff
f	Bf	bf	Ff	ff

D

	Bf	Bf	Bf	Bf
bF	BbFf	BbFf	BbFf	BbFf
bF	BbFf	BbFf	BbFf	BbFf
bF	BbFf	BbFf	BbFf	BbFf
bF	BbFf	BbFf	BbFf	BbFf

What is the phenotypic ratio of the offspring?

A 7 : 5 : 3 : 1
B 9 : 3 : 3 : 1
C 12 : 2 : 2
D 16 : 0 : 0 : 0

Q5: Assume that in plants, the allele for tall stems (D) is dominant to the allele for short stems (d), and the allele for purple flowers (P) is dominant to the allele for white flowers (p).

Which of the following Punnett squares correctly crosses two plants that are both heterozygous for these traits?

A

	Dp	Dp	Dp	Dp
Dp	DDpp	DDpp	DDpp	DDpp
Dp	DDpp	DDpp	DDpp	DDpp
Dp	DDpp	DDpp	DDpp	DDpp
Dp	DDpp	DDpp	DDpp	DDpp

C

	dP	dP	dP	dP
Dp	DdPp	DdPp	DdPp	DdPp
Dp	DdPp	DdPp	DdPp	DdPp
Dp	DdPp	DdPp	DdPp	DdPp
Dp	DdPp	DdPp	DdPp	DdPp

B

	DP	Dp	dP	dp
DP	DDPP	DDPp	DdPP	DdPp
Dp	DDPp	DDpp	DdPp	Ddpp
dP	DdPP	DdPp	ddPP	ddPp
dp	DdPp	Ddpp	ddPp	ddpp

D

	D	d	P	p
D	DD	Dd	DP	Dp
d	Dd	dd	dP	dp
P	DP	dP	PP	Pp
p	Dp	dp	Pp	pp

What is the phenotypic ratio of this cross?

A 9 : 3 : 3 : 1

B 12 : 3 : 1

C 10 : 6

D 16 : 0 : 0 : 0

Q6: Two pea plants are being crossed to investigate the inheritance of their flower colour (A, a) and the height of their stems (T, t). One of the parents is heterozygous for the trait of flower colour and homozygous dominant for the trait of height of stem. The other parent is homozygous recessive for both traits.

What is the correct way of writing the genotypes of the parents?

A aatt X TTaA

B AaTT X aatt

C aATT X aatt

D All the answers are correct.

Q7: Assume that, in guinea pigs, the allele for black fur (B) is dominant to the allele for white fur (b), and the allele for smooth fur (F) is dominant to the allele for rough fur (f). A guinea pig with genotype BbFf is crossed with a guinea pig with genotype BbFf. What is the probability ($\frac{..}{16}$)that the offspring will have white, rough fur?

A $\frac{0}{16}$

B $\frac{9}{16}$

C $\frac{3}{16}$

D $\frac{1}{16}$

Q8: Assume that in fruit flies, the allele for a grey body (G) is dominant to the allele for a black body (g), and the allele for normal wings (N) is dominant to the allele for small wings (n).

A fly with a genotype GgNn is crossed with a fly with a genotype ggnn.

What is the probability (%) that the offspring will have a grey body and small wings?

____ %

Q9: Which of the following best explains what is meant by dihybrid inheritance?

A The possibility that three or more alleles may exist for each locus on a chromosome.

B The inheritance of two different genes, located on different chromosomes, together.

C The formation of gametes using alleles inherited from both parents.

D The inheritance of a single characteristic that is controlled by one gene alone.

Q10: A test cross was performed to study the inheritance of trait A and trait B. The father is heterozygous for both traits and the mother is homozygous for both traits. The resulting phenotypes are distributed evenly among their offspring. Can you deduce the genotype of the mother?

A aaBb

B AABB

C aAbb

D aabb

Q11: Assume that in plants, the allele for tall stems (D) is dominant to the allele for short stems (d), and the allele for purple flowers (P) is dominant to the allele for white flowers (p).

Which of the Punnet squares correctly crosses a plant that is homozygous recessive for both traits with a plant that is homozygous dominant for both traits?

A

	DP	DP	dp	dp
DP	DDPP	DDPP	DdPp	DdPp
DP	DDPP	DDPP	DdPp	DdPp
dp	DdPp	DdPp	ddpp	ddpp
dp	DdPp	DdPp	ddpp	ddpp

B

	DP	DP	DP	DP
dp	DdPp	DdPp	DdPp	DdPp
dp	DdPp	DdPp	DdPp	DdPp
dp	DdPp	DdPp	DdPp	DdPp
dp	DdPp	DdPp	DdPp	DdPp

C

	D	D	P	P
p	Dp	Dp	Pp	Pp
p	Dp	Dp	Pp	Pp
d	Dd	Dd	Pd	Pd
d	Dd	Dd	Pd	Pd

D

	Dp	Dp	Dp	Dp
dP	DdPp	DdPp	DdPp	DdPp
dP	DdPp	DdPp	DdPp	DdPp
dP	DdPp	DdPp	DdPp	DdPp
dP	DdPp	DdPp	DdPp	DdPp

What is the phenotypic ratio of the offspring?

A 16 : 0 : 0 : 0

B 9 : 3 : 3 : 1

C 13 : 3

D 9 : 6 : 1 : 0

Q12: When crossing a male with the genotype aaBb and a female with the genotype AABb, which of the following is a possible genotype for their offspring?

A Aabb

B aabb

C AABb

D aaBB

Q13: Which of the following crosses will produce offspring which is composed only of the same genotypes of parents with ratio 1:1?

A AABb X AAbb

B AAbb X aaBb

C aaBB X AABb

D AaBb X AABB

Q14: Assume that in flies, body color and wing size are determined by two different genes, as outlined in the table provided.

Body Color Alleles	G (gray)	g (black)
Wing Size Alleles	N: normal	n: small (vestigial)

In a fly that has the genotype GgNn, what combination of alleles can be produced in the gametes?

A Gg, Nn

B GN, Gn, gN, gn

C gN, Gn

D GN, gn

Q15: Assume that in guinea pigs, the allele for black fur (B) is dominant to white fur (b), and the allele for smooth fur (F) is dominant to the allele for rough fur (f).

Which of the following Punnett squares correctly crosses a guinea pig that is homozygous dominant for black and smooth fur with a guinea pig that is heterozygous for both traits?

A

	BF	BF	BF	BF
bf	BbFf	BbFf	BbFf	BbFf
bf	BbFf	BbFf	BbFf	BbFf
bf	BbFf	BbFf	BbFf	BbFf
bf	BbFf	BbFf	BbFf	BbFf

B

	Bf	Bf	Bf	Bf
bF	BbFf	BbFf	BbFf	BbFf
bF	BbFf	BbFf	BbFf	BbFf
bF	BbFf	BbFf	BbFf	BbFf
bF	BbFf	BbFf	BbFf	BbFf

C

	BF	BF	BF	BF
BF	BBFF	BBFF	BBFF	BBFF
Bf	BBFf	BBFf	BBFf	BBFf
bF	BbFF	BbFF	BbFF	BbFF
bf	BbFf	BbFf	BbFf	BbFf

D

	BF	Bf	bF	bf
BF	BBFF	BBFf	BbFF	BbFf
Bf	BBFf	BBff	BbFf	Bbff
bF	BbFF	BbFf	bbFF	bbFf
bf	BbFf	Bbff	bbFf	bbff

What is the phenotypic ratio of the offspring?

A 9 : 3 : 3 : 1

B 12 : 4

C 13 : 2 : 1

D 16 : 0 : 0 : 0

Q16: Assume that in guinea pigs, the allele for black fur (B) is dominant to white fur (b), and the allele for smooth fur (F) is dominant to the allele for rough fur (f). A guinea pig with genotype Bbff is crossed with a guinea pig with genotype bbFF. What is the probability, in percent, that the offspring will have white, smooth fur?

[ ] %

Q17: Assume that, in plants, the allele for tall stems (D) is dominant to the allele for short stems (d), and the allele for purple flowers (P) is dominant to the allele for white flowers (p). A plant with genotype DdPp is crossed with a plant with genotype DdPp. What is the probability $\left(\frac{\cdots}{16}\right)$ that the offspring will have a tall stem and white flowers?

A $\frac{1}{16}$

B $\frac{3}{16}$

C $\frac{9}{16}$

D $\frac{0}{16}$

Q18: All of the following are possible gametes which can be produced during the cross between AaBB and AAbb except for --------------.

A AB

B Ab

C aB

D ab

Q19: Assume that in plants, seed shape and color are determined by two different genes, outlined in the table provided.

Seed Shape Alleles	R (round)	r (wrinkled)
Seed Color Alleles	G (green)	g (yellow)

In a plant that has the genotype RRgg, what combination of alleles can be produced in the gametes?

A RG only

B RG, Rg, rG, rg

C Rg only

D Rg, rG

Q20: What is the expected phenotypic ratio of a dihybrid cross between two heterozygous individuals?

A 9 : 3 : 3 : 1

B 9 : 6 : 1

C 12 : 3 : 1

D 16 : 0 : 0 : 0

Guide Answer:

1	C	11	B,A		
2	C	12	A		
3	C	13	A		
4	A,B	14	B		
5	B,A	15	C,D		
6	B	16	50		
7	D	17	B		
8	25	18	D		
9	B	19	C		
10	D	20	A		

Q1: The table provided shows the different genotypes of the 4 blood groups in humans.

Blood Group	A	B	AB	O
Genotype	I^AI^A or I^AI^O	I^BI^B or I^BI^O	I^AI^B	I^OI^O

The table shows that if one allele for A is inherited and one allele for B is inherited, both are expressed simultaneously in the blood type. What trait is this demonstrating?

A Codominance

B Incomplete dominance

C Recessive alleles

D Complete dominance

Q2: The table provided shows the different genotypes of the 4 blood groups in humans.

Blood Group	A	B	AB	O
Genotype	I^AI^A or I^AI^O	I^BI^B or I^BI^O	I^AI^B	I^OI^O

A female with the genotype I^AI^B reproduces with a male with the genotype I^AI^O. What is the probability, in percent, that their offspring will have blood group AB? %

Q3: A dispute about the paternity of a child is occurring between a couple. The mother is blood type A and the child is blood type AB. The man claiming to be the father is blood type O. Is this man likely to be the father? Why? Use the blood group table provided to help you.

Blood Group	A	B	AB	O
Genotype	I^AI^A or I^AI^O	I^BI^B or I^BI^O	I^AI^B	I^OI^O

A Yes, because the child could have inherited an O allele from the father that is not being expressed because AB is dominant.

B Yes, because it is impossible to tell paternity from blood group.

C No, because the child has inherited an allele for blood type A from their father and this is not possible with blood type O.

D No, because the child has inherited an allele for blood type B from their father and this is not possible with blood type O.

Q4: Which of the following parents **cannot** give birth to a baby with blood group O?

A A father with blood group AB and a mother with blood group O

B A father with blood group A and a mother with blood group O

C A father with blood group A and a mother with blood group B

D A father with blood group B and a mother with blood group O

Q5: Consider two sparrows, one with yellow feathers and the other with blue feathers. When they mated together, their offspring were all with green feathers. What can you infer about the feather colour trait in this kind of sparrow?

A The blue feathers trait is dominant over the yellow feathers trait.

B The green feathers trait is dominant over the blue and yellow feathers traits.

C The trait is not allelomorphic.

D The inheritance of the trait does not follow Mendel's laws.

Q6: A man claiming to be a long lost child of a recently deceased millionaire argues he has a claim to the inheritance. The millionaire has blood group O and the child has blood group AB. Could the millionaire be the father? Why? Use the blood group table provided to help you.

Blood Group	A	B	AB	O
Genotype	I^AI^A or I^AI^O	I^BI^B or I^BI^O	I^AI^B	I^OI^O

A Yes, as the child could have inherited the alleles for group AB from their mother alone.

B No, as the child would have inherited one allele for group O from the father.

C No, as the man would have blood group O if the father did.

D Yes, because it is impossible to tell paternity from the blood group.

Q7: A long-furred breed of rabbits, X, is crossed with a short-furred breed of rabbits, Y. All of the resulting offspring have fur of medium length which is longer than that of Y but shorter than that of X. If you know that both X and Y are purebred, which of the following statements does **not** apply to this pattern of inheritance?

A The phenotypes of both parents are equally dominant and they are fully expressed in the offspring.

B The inheritance of the fur length gene in this example is controlled by two types of alleles: one for the short fur and the other for the long fur.

C If two of the offspring are crossed, three phenotypes will appear in the next generation and 50% of the rabbits should have fur of medium length.

D The genotype of each rabbit can be indicated or estimated by the length of its fur.

Q8: If you perform a test cross of two Rh factor genes, to which of the following would this test cross **not** conform?

A The lack of dominance (codominance)

B The law of segregation of genetic factors

C The law of complete dominance

D Both of law of segregation of genetic factor and lack of dominance.

Q9: For the following key words, select the best definition.

- Codominance

A Codominance occurs if an organism that is heterozygous for an allele expresses a distinct, intermediate phenotype.

B Codominance occurs when three or more alleles can occupy the same locus.

C Codominance occurs when only one copy of the allele is needed to be expressed in the phenotype of an organism.

D Codominance occurs when both alleles for a trait are simultaneously expressed in the phenotype.

- Incomplete dominance

A Incomplete dominance occurs if an organism that is heterozygous for an allele expresses a distinct, intermediate phenotype.

B Incomplete dominance occurs when three or more alleles can occupy the same locus.

C Incomplete dominance occurs when only one copy of the allele is needed to be expressed in the phenotype of an organism.

D Incomplete dominance occurs when both alleles for a trait are simultaneously expressed in the phenotype.

Q10: Shorthorn cows show codominance in their coat color. They can be red, white, or roan—a mixture of the two (pictured).Which of the following Punnett squares shows the correct cross when a cow homozygous for a red coat and a bull with a roan coat breed?

A

	C^R	C^R
C^W	C^WC^W	C^RC^R
C^W	C^WC^W	C^RC^R

C

	C^R	C^R
C^W	C^RC^W	C^RC^W
C^W	C^RC^W	C^RC^W

B

	C^R	C^W
C^R	C^RC^R	C^RC^W
C^W	C^RC^W	C^WC^W

D

	C^R	C^R
C^R	C^RC^R	C^RC^R
C^W	C^RC^W	C^RC^W

Q11: The table provided shows the different genotypes of the 4 blood groups in humans.

Blood Group	A	B	AB	O
Genotype	I^AI^A or I^AI^O	I^BI^B or I^BI^O	I^AI^B	I^OI^O

A female with the genotype I^OI^O reproduces with a male with the genotype I^AI^B. What is the probability, in percent, that their offspring will have blood group B?

[ ] %

Q12: Snapdragon flowers (pictured) show incomplete dominance in the color of their petals. The petals can be red (C^RC^R), white (C^WC^W), or pink (C^RC^W).

Which of the following Punnet squares shows the correct cross between two pink flowers?



A

	C^R	C^R
C^W	C^RC^R	C^RC^R
C^W	C^WC^W	C^WC^W

B

	C^R	C^W
C^R	C^RC^R	C^RC^W
C^R	C^RC^R	C^RC^W

C

	C^R	C^R
C^W	C^RC^W	C^RC^W
C^W	C^RC^W	C^RC^W

D

	C^R	C^W
C^R	C^RC^R	C^RC^W
C^W	C^RC^W	C^WC^W

Q13: The shape of hemoglobin, the pigment in red blood cells, can demonstrate codominance. The genotypes and phenotypes are outlined in the table provided.

Genotype	Hb^AHb^A	Hb^sHb^s	Hb^AHb^s
Phenotype	Red blood cells have a normal, biconcave shape.	Sickle cell anemia: Red blood cells have a sickle shape, which causes severe anemia.	Sickle cell trait: The majority of red blood cells have a normal shape and do not cause anemia under normal conditions.

What combination of parents would give a probability of at least 50% for their offspring **not** having sickle cell anemia or the sickle cell trait?

A. Hb^AHb^s and Hb^sHb^s

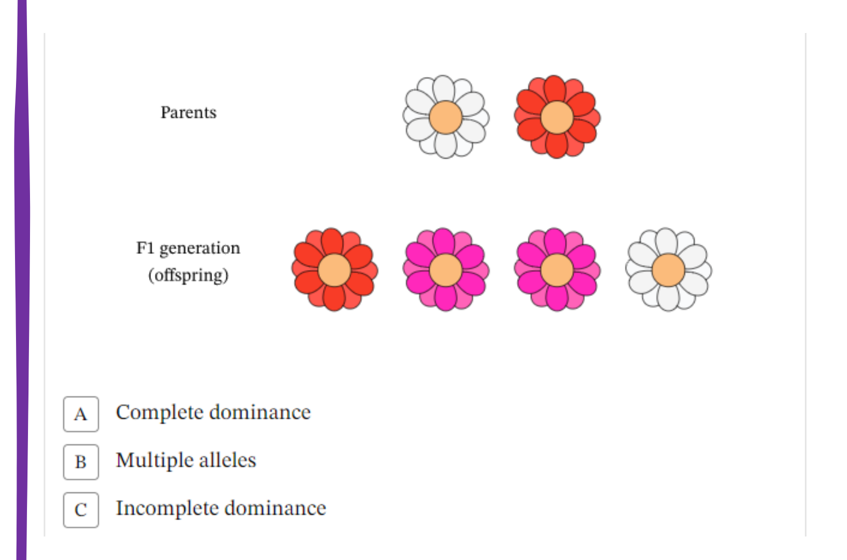
B. Hb^AHb^s and Hb^AHb^A

C. Hb^AHb^s and Hb^AHb^s

D. There is no combination possible that gives this result.

Q14: The diagram provided shows parent plants and their offspring (the F1 generation).

What trait (incomplete dominance, complete dominance, or multiple alleles) is being demonstrated by the inheritance of flower color?



A. Complete dominance

B. Multiple alleles

C. Incomplete dominance

Q15: Which of the following is **not** observed in the inheritance of the four main blood groups?

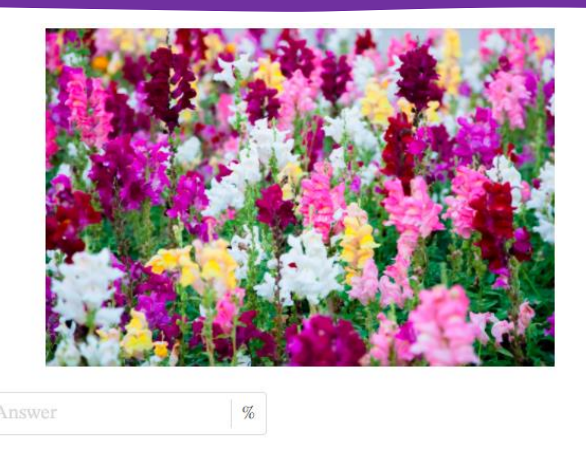
A. Multiple alleles

B. Multiple genes on a single chromosome

C. Independent assortment

D. Complete dominance

Q16: Snapdragon flowers (pictured) show incomplete dominance in the color of their petals. The petals can be red (C^RC^R), white (C^WC^W), or pink (C^RC^W). Two pink flowers are crossed. What is the probability, in percent, that their offspring will also have pink flowers?



Answer %

Q17: Consider a group of rabbits of the same strain. Some of them have black fur, some have white fur, and others have grey fur. If you want to get all the colours in one offspring, which two rabbits would you choose to cross?

A Grey rabbit X black rabbit

B Grey rabbit X grey rabbit

C White rabbit X black rabbit

D White rabbit X grey rabbit

Q18: A man with blood group B married a woman with blood group A. It is impossible for them to have a child with blood group------------------- .

A O

B AB

C B

D None of the above

Q19: Codominance is a phenomenon in which a heterozygous individual expresses the phenotype of each allele simultaneously without blending. Codominance applies to ------------------ .

A ABO blood groups

B flower colour in *Antirrhinum* plants

C Rhesus factor

D All of the answers are correct.

Q20: Which of the following best defines “multiple alleles” for a given trait?

A Multiple alleles refer to both alleles for a trait being simultaneously expressed in the phenotype.

B Multiple alleles refer to three or more alleles occupying the same locus.

C Multiple alleles refer to an organism that is heterozygous for an allele expressing a distinct, intermediate phenotype.

Q21: The inheritance of one of the following traits follows a complete dominance pattern in some cases and does not follow such a pattern in other cases. Which of the following traits does this statement refer to?

A The flower colour in the *Antirrhinum* plant

B The ABO blood groups in humans

C The seed colour in the pea plant

D None of the answers are correct.

Q22: The shape of hemoglobin, the pigment in red blood cells, can demonstrate codominance. The genotypes and phenotypes are outlined in the table provided.

Genotype	Hb^AHb^A	Hb^sHb^s	Hb^AHb^s
Phenotype	Red blood cells have a normal, biconcave shape.	Sickle cell anemia: Red blood cells have a sickle shape, which causes severe anemia.	Sickle cell trait: The majority of red blood cells have a normal shape and do not cause anemia under normal conditions.

Both parents have the genotype Hb^AHb^s. What is the probability (%) that their offspring will have sickle cell anemia?

Answer %

Q23: Using the table provided, which of the following combinations of genotypes from parents would give a probability of at least 50% of their offspring having blood type B?

Blood Group	A	B	AB	O
Genotype	I^AI^A or I^AI^O	I^BI^B or I^BI^O	I^AI^B	I^OI^O

A I^BI^O and I^AI^O

B I^AI^B and I^BI^O

C I^AI^B and I^AI^B

D I^BI^B and I^AI^A

Q24: Shorthorn cows show codominance in their coat color. They can be red, white, or roan—a mixture of the two (pictured).

Which of the following Punnett squares shows the correct cross when a cow homozygous for a white coat and a bull homozygous for a red coat breed?



A

	C^R	C^R
C^R	C^RC^R	C^RC^R
C^W	C^RC^W	C^RC^W

B

	C^R	C^R
C^W	C^WC^W	C^RC^R
C^W	C^WC^W	C^RC^R

C

	C^R	C^R
C^W	C^RC^W	C^RC^W
C^W	C^RC^W	C^RC^W

D

	C^R	C^W
C^R	C^RC^R	C^RC^W
C^W	C^RC^W	C^WC^W

Guide Answer:

1	A	11	50	21	B
2	25	12	D	22	25
3	D	13	B	23	B
4	A	14	C	24	C
5	D	15	B		
6	B	16	50		
7	A	17	B		
8	A	18	D		
9	D,A	19	A		

10	D	20	B		

Q1: A husband and his wife are trying to conceive a child. The husband's blood type is O− and the wife's is A−. The mother gave birth to a baby who is Rh+, which of the following births will be in danger?

A The 2nd birth

B The 4th birth

C The 3rd birth

D The statement is incorrect.

Q2: A man who is Rh− married a woman who is homozygous for Rh+. Which of their babies would be at risk of death?

A The first, second, and third babies

B The second baby

C The third baby

D None of the answers is correct.

Q3: All the following blood groups can accept transfusion from a person with blood group O+ except for ---------------.

A A+

B AB−

C B+

D None of the answers are correct.

Q4: What does having a positive Rhesus factor (Rh+) mean?

A There are Rhesus antigens present on the red blood cells.

B There are no Rhesus antigens present on the red blood cells.

C The red blood cells have responded positively to the introduction of a Rhesus antigen.

Q5: A person's blood type indicates what antigens will be found on the surface of their red blood cells and the type of antibodies they will produce. What antibodies will a person with blood type B produce?

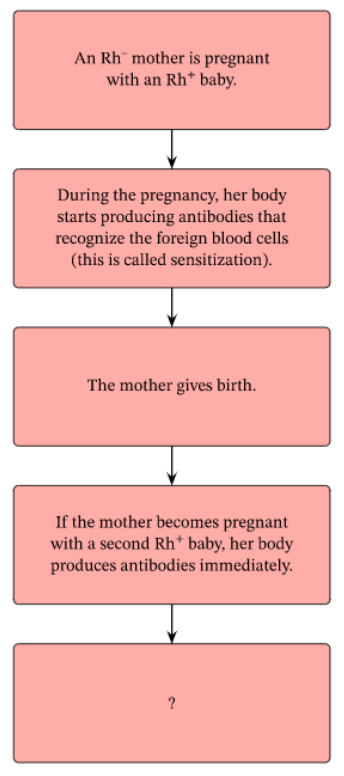
A Anti-A only

B Both anti-B and anti-A

C Anti-B only

D Neither anti-B nor anti-A

Q6: The flowchart shows the series of events that can occur if a Rhesus-negative mother is pregnant with a Rhesus-positive child. What would the most likely statement to complete the flowchart be?



A The antigens produced by the baby can attack the antibodies of the mother.

B The child will inherit Rh^- antigens from its mother and become Rh^-.

C The antibodies produced by the mother can attack the red blood cells of the baby.

D The mother will obtain Rh^+ antigens from the child and become Rh^+.

Q7: Researching and understanding the blood groups of humans can have many uses. Which of the following is **not** a direct benefit of understanding the different blood groups?

A Improving the oxygen-carrying capacity of hemoglobin

B Ensuring safe and correct blood transfusions are carried out

C Determining the paternity of a child

D Studying human evolution

Q8: Consider this partially complete table of blood groups and the antigens and antibodies found within blood.

Q8: Consider this partially complete table of blood groups and the antigens and antibodies found within blood.

Blood Group	Antigens	Antibodies
A	A	Anti-B
B	B	Anti-A
AB	?	N/A
?	N/A	Anti-A Anti-B

➢ What is the missing blood group?

A	AO
B	O
C	BA
D	No blood group is missing.

➢ What are the missing antigens?

A	A and B
B	A
C	O
D	No antigens are missing.

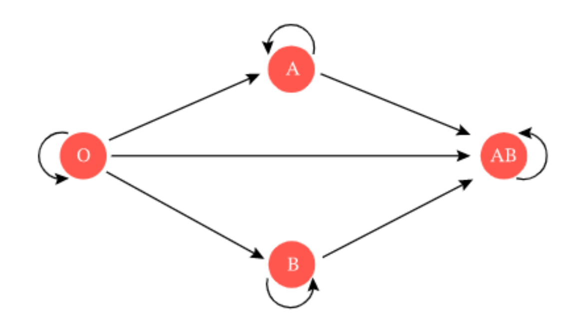
Q9: A man whose blood group is A and his genotype is AO married a woman whose blood group is B and her genotype is BO. The man can donate blood to ------------- of his offspring.

A	75%
B	50%
C	60%
D	100%

Q10: The ABO system is used to define the blood groups in humans. What two substances in the blood does it use to do this?

A	Antigens found on the surface of red blood cells and antibodies found in the blood plasma
B	Antibodies found in the blood plasma and lymphocytes found on the surface of red blood cells
C	The genetic material found in red blood cells and the proteins found in the platelets
D	Antigens found on the surface of white blood cells and platelets found in the blood plasma

Q11: Blood can be transfused between individuals. The diagram provided shows which blood group can receive blood from or donate blood to other groups.



- Using the information in the diagram, which blood type is commonly referred to as the universal donor?

A	B
B	O
C	AB
D	A

- Using the information in the diagram, which blood type is commonly referred to as the universal receiver?

A	A
B	O
C	B
D	AB

Q12: The method for determining a person's blood type by agglutination is outlined below:
1. A sample of blood is taken from the person who needs their blood type determined.
2. Two large drops of blood are placed on clean, sterile glass slides.
3. Anti-A antibodies are mixed in with one of the two drops of blood.
4. Anti-B antibodies are mixed in with the other drop of blood.

What result (agglutination or no agglutination) would you expect for type B blood mixed with anti-B antibodies?

A	No agglutination
B	Agglutination

Q13: A sample of red blood cells is taken from a person. The blood cells are found to have type B antigens on their cell surface, and there are anti-A antibodies in the blood plasma. Which blood group does this person belong to?

A A

B AB

C B

D O

Q14: Which of the following statements about Rhesus factors in humans is true?

A 50% of the world's population are Rh+,and 50% are Rh–.

B Around 99% of humans are Rh–.

C Humans with Rh+ blood types can donate blood to any other human.

D The majority of humans are Rh+.

Q15: There are three persons with three different blood groups. The blood of the first one agglutinates with anti-A serum, while the blood of the other two persons does not agglutinate with the same serum. If you know that the second person can donate blood to the first one but cannot donate to the third one, what are their respective blood groups?

A AB, B, and O

B AB, O, and B

C A, O, and B

D A, O, and AB

Q16: People with blood type are considered universal donors.

A AB+

B O+

C A−

D None of the answers are correct.

Q17: Which of the following is **not** a blood type found in humans?

A AO

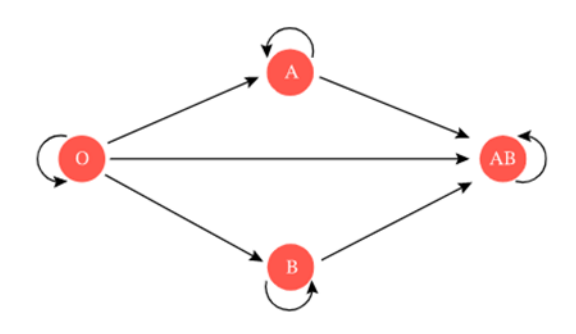
B AB

C O

D A

E B

Q18: Blood can be transfused between individuals. The diagram provided shows which blood group can receive blood from or donate blood to other groups.



Which of the following statements is correct?

A People with blood type AB can receive any other blood type.

B People with blood type B can donate blood to any other person.

C People with blood type O can only receive blood that is type AB.

D People with blood type O cannot receive any blood transfusions.

E People with blood type A can only receive blood that is type A.

Q19: Blood samples can be tested for blood groups by agglutination. A small sample of blood is mixed with antibodies A and antibodies B. The table provided shows some results.

What is the missing result?

Blood Type	Anti-A	Anti-B
A	Agglutination	No agglutination
B	No agglutination	...
AB	Agglutination	Agglutination
O	No agglutination	No agglutination

A No agglutination

B Agglutination

Q20: Which antibodies and antigens would a person with the blood type AB negative have?

A Antigen A, antigen B, and Rh antigen

B Antibody A, antigen B, and Rh antibody

C Antigen A, antibody B, and Rh antigen

D Antigen A, antigen B, and Rh antibody

Q21: A blood sample was taken from a man with an unknown blood group to determine his blood type. When antibody B was added to the sample, agglutination was observed. Then, antibody A was added and the agglutination remained. Another blood sample was taken to determine the presence of Rh factor and it was found that the sample was Rh-positive. According to these results, what is the man's blood type?

A His blood type is B+ because antibody B reacted with antigen B, causing agglutination, and the Rh factor test was positive.

B His blood type is AB because antibodies A and B caused agglutination when added. However, the Rh factor test was done incorrectly.

C His blood type is still unknown because the test was not carried out correctly. However, the Rh factor test result was accurate.

D His blood type is BO because antibody B reacted with antigen B and the Rh antibody reacted with antigen O.

Q22: Blood samples can be tested for blood groups by agglutination. A small sample of blood is mixed with antibodies A and antibodies B. The table provided shows some results. What is the missing result?

Blood Type	Anti-A	Anti-B
A	Agglutination	No agglutination
B	No agglutination	Agglutination
AB	Agglutination	Agglutination
O	⋯	No agglutination

A No agglutination

B Agglutination

Q23: Which of the following statements is **not** correct about the inheritance of the Rhesus factor?

A The inheritance of Rhesus factor antigens is controlled by three pairs of genes which are located on a single pair of chromosomes.

B For a person to be Rhesus positive (Rh+), all of the three pairs of the inherited Rhesus genes should be dominant.

C All of the inherited Rhesus genes of the Rhesus-negative person (Rh−) are recessive.

D The genotype of an Rh-positive person could be either Rh+/Rh+ or Rh+/Rh−, whereas the genotype of an Rh-negative person should be Rh−/Rh−.

Q24: A blood sample from a person does not contain any antibody for any type of blood group antigen. The blood group of this person is -------------------.

A	O^+
B	O^-
C	AB^+
D	AB^-

Q25: If your father's blood type is AB+ and your mother's is O–,which of your parents' bodies would surely reject your possible blood type upon transfusion?

A	The mother's body
B	The father's body
C	Both parents' bodies
D	None of the parents' bodies

Guide Answer:

1	D	11	B,D	21	C
2	D	12	B	22	A
3	B	13	C	23	B
4	A	14	D	24	C
5	A	15	A	25	A
6	C	16	D		
7	A	17	A		
8	B,A	18	A		
9	50	19	B		
10	A	20	D		

Q1: Which of the following statements is true of complementary genes?

A Complementary genes are genes in which two genes or more contribute to the expression of one characteristic or trait.
B Complementary genes are genes in which one gene produces a characteristic and the second is only able to supplement this characteristic.
C Complementary genes are genes in which neither allele is recessive and the phenotypes of both alleles are expressed.
D Complementary genes are genes in which one gene is dominant and the second is recessive.

Q2: Flower color in sweet pea plants is an example of a characteristic affected by complementary gene action. The flowers can be white or purple; in this scenario, there must be a dominant allele present for both genes for the purple flower color to be shown.

Which of the following genotypes would give a plant with purple flowers?

A Aabb
B aaBB
C aabb
D AaBb
E AAbb

Q3: Which of the following is an example of complementary genes?

A The appearance of pink colour in the flower of sweet pea plants
B The appearance of blood type AB in humans
C The absence of chlorophyll in corn plants
D The appearance of red colour in the eyes of drosophila

Q4: Complete the following statements about alleles.

- An allele that is always expressed in the phenotype when present is known as .

A mutated
B prominent
C diploid
D recessive
E dominant

➢ An allele that is only expressed in the phenotype when two copies are present is known as .

A	recessive
B	submissive
C	haploid
D	mutated
E	dominant

Q5: Two individuals were crossed together and all their offspring have the same phenotype which is unlike that of their parents. Which of the following types of inheritance might this case be?

A	Lack of dominance only
B	Complementary genes only
C	Complementary genes or lack of dominance
D	None of the answers are correct.

Q6: Flowers of sweet pea plants can be purple or white. The diagram provided shows the biochemical pathway that allows the production of purple flowers in sweet pea plants

If a mutation in gene B caused the enzyme it codes for to be nonfunctioning, what would the outcome be?

A	The plant would have purple flowers.
B	The plant would have white flowers.
C	The plant would wilt and die.
D	The plant would have no flowers.

Q7: The test cross of two parents expressing a recessive phenotype produces offspring expressing the dominant phenotype. Which of the following could be true about this test cross?

A It is a normal cross of one trait following the law of complete dominance.
B The recessive alleles of the parents combine in their offspring to produce dominant phenotypes.
C Each parent has a dominant allele which was passed down to their offspring.
D It is a normal cross of two traits following Mendel's law.

Q8: Assume that the color of fur in mice is determined by two genes and their complementary action. The table provided shows the genotypes of different mice.

Genotype	Phenotype	Enzyme A	Enzyme B
AABB	Black	Functional	Z
aabb	White	Y	Nonfunctional
AaBb	X	Functional	Functional

- What should replace X?

A Black
B White

- What should replace Y?

A Nonfunctional
B Functional

- What should replace Z?

A Functional
B Nonfunctional

Q9: Flower color in sweet pea plants is an example of a characteristic affected by complementary gene action. The flowers can be white or purple; in this scenario, there must be a dominant allele present for both genes for the purple flower color to be shown.

Which of the following genotypes would give a plant with white flowers?

A AaBB
B AABb
C AaBb
D aaBB
E AABB

Q10: Assume fur color in mice is an example of a characteristic affected by complementary gene action. The fur can be white or black; in this scenario, there must be a dominant allele present for both genes for the black color to be shown.

Which of the following genotypes would give a mouse black fur?

A aaBB
B AAbb
C Aabb
D AaBb
E All of the above

Q11: Which of the following best defines the term *complementary genes*?
A Complementary genes are genes that inhibit the production of complement proteins.
B Complementary genes are two genes that are simultaneously expressed in the phenotype.
C Complementary genes are two or more different genes that work together to contribute to a particular trait.
D Complementary genes are genes that “mix” together to produce a new, distinct phenotype.

Q12: The color of sweet pea flowers is determined by two genes and their complementary action. The table provided shows the genotypes of different sweet pea plants.

Genotype	Phenotype	Enzyme A	Enzyme B
AABB	Purple	Functional	Functional
Aabb	White	Y	Nonfunctional

aabb	X	Nonfunctional	Z

- What should replace X?

A Purple
B White

- What should replace Y?

A Nonfunctional
B Functional

- What should replace Z?

A Functional
B Nonfunctional

Q13: Assume fur color in mice is an example of a characteristic affected by complementary gene action. The fur can be white or black; in this scenario, there must be a dominant allele present for both genes for the black color to be shown.

Which of the following genotypes would give a mouse with white fur?

A AaBb
B aaBB
C AABB
D AABb
E AaBB

Q14: Assume that fur color in mice is controlled by complementary genes. The diagram provided shows the biochemical pathway that results in a mouse having black fur. What will happen if enzyme B is no longer functional?

Precursor 1 (colorless)
Precursor 2 (colorless)
Black pigment
catalyzes reaction
catalyzes reaction
Enzyme A
Enzyme B
codes for ...
codes for ...
Gene A
Gene B

A The mouse will have no fur.

B The mouse will die.

C The fur will be white/colorless.

D The fur will be black

Q15: The Punnett square shows the phenotypes resulting from a cross between mice that are heterozygous for fur color. What are the missing alleles?

	AB	?	aB	ab
AB	AABB	AABb	AaBB	AaBb
Ab	AABb	AAbb	AaBb	Aabb
aB	AaBB	AaBb	aaBB	aaBb
ab	AaBb	Aabb	aaBb	aabb

A aB

B ab

C Ab

D AB

Q16: Which of the following crosses in a plant would produce a generation with blue flower plants (dominant) and yellow flower plants (recessive) with a ratio of 3:1,if you know that they must have a dominant allele in both genes to express the dominant phenotype?

A AaBb X AaBB

B AAbb X aaBB

C AaBb X AaBb

D AABb X AaBB

Q17: The shape of the seeds of a shepherd's purse plant is controlled by two genes, A and B. A triangular seed is the dominant phenotype and an oval seed is the recessive phenotype. The presence of any dominant allele for either of these genes will mask the recessive alleles. If two parent plants with the genotype AaBb were crossed, what would the phenotypic ratio of their offspring be?

A 9 triangular : 7 oval

B 8 triangular : 8 oval

C 15 triangular : 1 oval

D 16 triangular : 0 oval

Q18: Assume that two rabbits with white fur mate together, and all their offspring get orange fur. Which of the following would not be true about the inheritance of this trait?

A The parents would have the same genotype.
B This trait would be controlled by more than one gene.
C The second offspring would include the genotypes of the parents of the first offspring.
D The orange colour would be dominant over the white colour.

Q19: Which of the following is true for a case in which a particular phenotype is controlled by the complementation of two dominant genes?

A A dihybrid cross of heterozygous individuals for both genes gives a 9:3 phenotypic ratio.
B A dihybrid cross of heterozygous individuals for both genes gives a 9:7 phenotypic ratio.
C A dihybrid cross of heterozygous individuals for both genes gives a 3:1 phenotypic ratio.
D A dihybrid cross of heterozygous individuals for both genes gives a 9:1 phenotypic ratio.

Q20: If two parents with recessive phenotypes gave offspring with 75% carrying their phenotype and 25% carrying the other phenotype, what type of inheritance controls this trait?

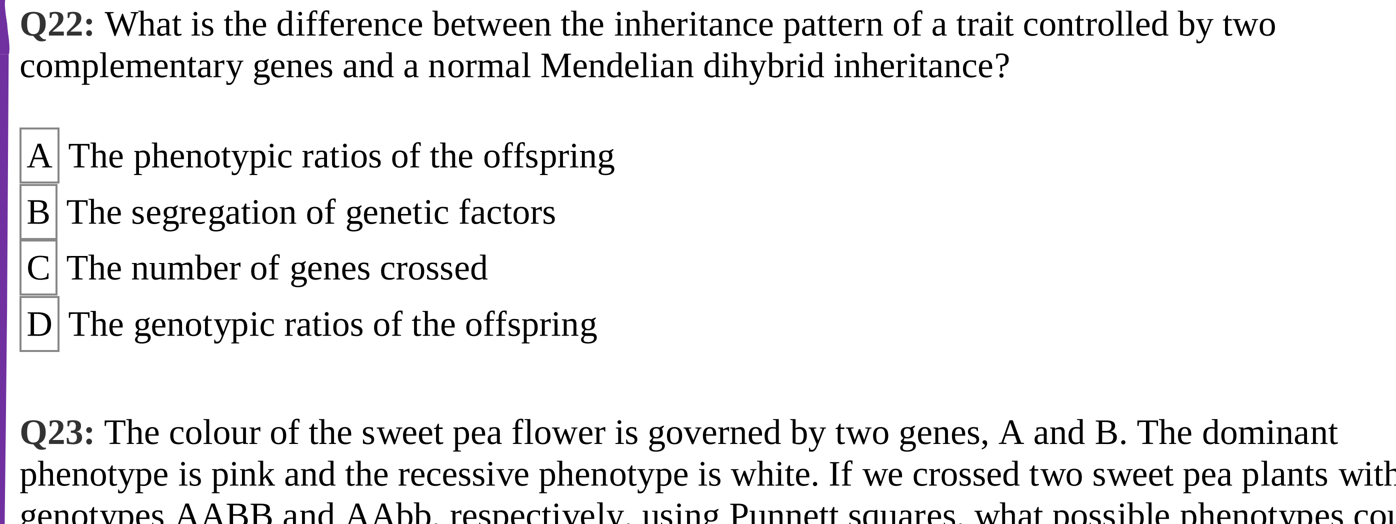
A Mendelian inheritance
B Complementary genes
C Sex-linked inheritance
D None of these answers are correct.

Q21: Assume that inheritance of fur color in mice is controlled by complementary genes; for the dominant phenotype to be expressed, there must be a dominant allele of each gene present in the genotype.

The Punnett square provided shows the phenotypes resulting from a cross between mice that are heterozygous for fur color. Complete the Punnett square to state the ratio of dominant to recessive phenotypes.

A 15:1
B 9:7
C 3:1
D 8:9

	AB	Ab	aB	ab
AB	AABB	AABb	AaBB	AaBb
Ab	AABb			
aB	AaBB			
ab	AaBb			


Q22: What is the difference between the inheritance pattern of a trait controlled by two complementary genes and a normal Mendelian dihybrid inheritance?

A The phenotypic ratios of the offspring
B The segregation of genetic factors
C The number of genes crossed
D The genotypic ratios of the offspring

Q23: The colour of the sweet pea flower is governed by two genes, A and B. The dominant phenotype is pink and the recessive phenotype is white. If we crossed two sweet pea plants with the genotypes AABB and AAbb, respectively, using Punnett squares, what possible phenotypes could be observed in the second generation F2?

A Only pink flowers
B Pink flowers and white flowers
C Only white flowers
D There is not enough information to determine phenotypes of F2.

Guide Answer:

1	A	11	C	21	B
2	D	12	B,B,B	22	A
3	A	13	B	23	B
4	E,A	14	C		
5	C	15	C		
6	B	16	A		
7	C	17	C		
8	A,A,A	18	A		
9	D	19	B		
10	D	20	B		

Q1: Complete the statement: If light intensity is low and less chlorophyll is synthesized by the plant, the rate of photosynthesis --------------------.

A increases

B decreases

C remains constant

Q2: The synthesis of chlorophyll in a plant is regulated by specific genes. Which of the following best defines the term *gene*?

A A protein that is expressed in the physical characteristics of an organism

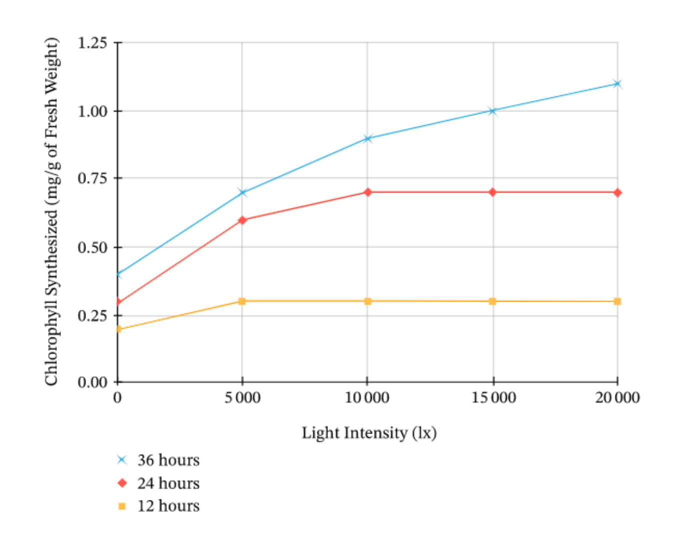
B A section of mRNA that can be translated into a section of DNA

C A section of DNA that codes for the production of a protein or another functional unit

D All the genetic material that is contained within an organism

Q3: Three groups of plants belonging to the same species are exposed to different intensities of light. Group 1 was exposed to these light intensities for 12 hours,group 2 for 24 hours,and group 3 for 36 hours. The graph provided shows the amount of chlorophyll synthesized by these groups of plants at different light intensities.

Which of the following statements about the graph is correct?



A A plant exposed to 15 000 lx for 24 hours will synthesize over double the amount of chlorophyll than a plant exposed to the same intensity for only 12 hours.

B Chlorophyll production increases exponentially between 10 000 lx and 20 000 lx for a plant exposed to both for 24 hours.

C At all light intensities, chlorophyll synthesis was greater in the plants exposed for 24 hours compared to those exposed for 36 hours.

D A plant exposed to 10 000 lx for 36 hours will synthesize over double the amount of chlorophyll than a plant exposed to the same intensity for only 24 hours.

E Plants exposed to 0 lx for 24 hours will not synthesize any chlorophyll.

Q4: Why are the internal leaves of cabbage devoid of green color?

A Because they are not exposed to light

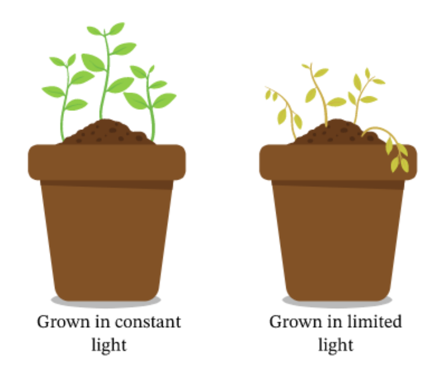
B Because they are devoid of the gene of chlorophyll

C Both of the previous answers are correct.

D Because they digest chlorophyll to produce energy

Q5: Two groups of seedlings were grown in different conditions for 4 weeks; one group was grown in constant light, and the other was grown with very limited access to light. The diagram provided shows the results.

What can be assumed about chlorophyll synthesis from these results?



A Plants grown in constant light synthesize more chlorophyll and, therefore, appear greener.

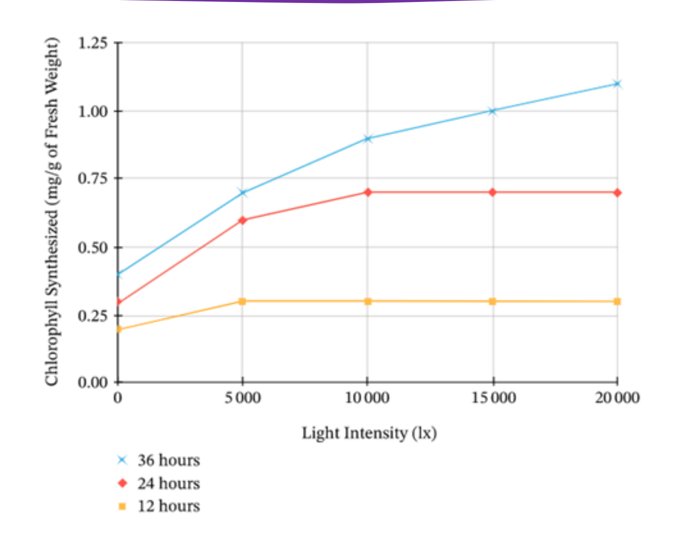
B Synthesis of chlorophyll is not affected by the presence of light.

C Plants grown in limited light synthesize more chlorophyll and, therefore, appear yellower.

Q6: Three groups of plants belonging to the same species are exposed to different intensities of light. Group 1 was exposed to the light intensities shown for 12 hours,group 2 for 24 hours,and group 3 for 36 hours.

The graph provided shows the amount of chlorophyll synthesized by these groups of plants at different light intensities.

What can be concluded from this graph?



A For all light intensities, more chlorophyll is synthesized when the plant is exposed to the light for 36 hours than when it is exposed to the light for 24 or 12 hours.
B The intensity of light does not have an effect on how much chlorophyll is synthesized by a plant, but the duration of exposure does.
C For all light intensities, more chlorophyll is synthesized when the plant is exposed to the light for 12 hours than when it is exposed to the light for 36 or 24 hours.
D For all light intensities, more chlorophyll is synthesized when the plant is exposed to the light for 24 hours than when it is exposed to the light for 36 or 12 hours.

Q7: Chlorophyll is required by the chloroplasts of leaves to capture light. For what process do the chloroplasts require this light energy?
A Photosynthesis
B Mitosis
C Translation
D Respiration
E Transcription

Q8: Chloroplasts contain the pigment *chlorophyll*. What color is it?
A Green
B Yellow
C Red
D Blue
E Brown

Q9: Which of the following correctly describes the relationship between light intensity and the synthesis of chlorophyll in a plant?

A Exposure to light intensity has no effect on the synthesis of chlorophyll, only on how much photosynthesis can be carried out.
B The more light a plant is exposed to, the less chlorophyll will be synthesized.
C Prolonged exposure to low light levels, or no light, prevents a plant from synthesizing enough chlorophyll.

Q10: Complete the following statement: In the absence of light, the production of chlorophyll becomes reduced, and this causes the leaves of the plant to turn ------------------.

A translucent
B green
C yellow
D black
E white

Guide Answer:

1	B				
2	C				
3	A				
4	A				
5	A				
6	A				
7	A				
8	A				
9	C				
10	C				

Q1: Which of the following is likely to be the consequence if an embryo inherits X chromosomes from both parents, making the total number of chromosomes 46: 44 somatic and 2 sex chromosomes?

A The embryo will develop into a female child.

B The embryo will not develop and will die.

C The embryo will lack female hormones.

D The embryo will develop into a male child.

Q2: Which gamete is responsible for determining the sex of a fetus?

A Egg

B Sperm

C Neither

Q3: Which of the following correctly describes the chromosomes contained within a human female somatic cell?

A 46 autosomes + XY

B 23 autosomes + XY

C 44 autosomes + XX

D 46 autosomes + XX

E 44 autosomes + XY

Q4: It was thought that women were responsible for determining the sex of the foetus, but scientific advancements proved otherwise. However, which of the following could make the aforementioned true if fertilization occurred between it and a normal gamete?

A A 22, O sperm

B A 22, O ovum

C A 24, XY ovum

D A 24, XX sperm

Q5: A couple are expecting a child. What is the probability, in percent, that this child will be born female?

______ %

Q6: A human somatic (body) cell contains 46 chromosomes. How many chromosomes does a gamete (sex cell) contain?

______ Chromosomes

Q7: Which of the following statements is correct about the sex chromosomes contained in the sperm and ova?

A Ova only carry Y chromosomes, whereas sperm can carry either X or Y chromosomes.

B Sperm only carry Y chromosomes, whereas ova only carry X chromosomes.

C Ova only carry X chromosomes, whereas sperm can carry either X or Y chromosomes.

D Sperm only carry X chromosomes, whereas ova can carry either X or Y chromosomes.

Q8: Which of the following Punnett squares correctly shows the inheritance of sex chromosomes in humans?

A

	Female	
Male	X	Y
X	XX	XX
Y	XY	YY

B

	Female	
Male	X	X
Y	XY	XY
Y	XY	XY

C

	Female	
Male	X	X
X	XX	XX
Y	XY	XY

D

	Female	
Male	X	Y
X	XX	XY
X	XX	XY

Q9: How do the structures of the XandY chromosomes in humans differ?

A The X chromosome contains less than 50% of the genes found on the Y chromosome.

B The X chromosome is much shorter than the Y chromosome.

C The Y chromosome is much shorter than the X chromosome.

D The Y chromosome is much wider than the X chromosome.

E There is no difference in structure between the XandY chromosomes.

Q10: Why do gametes contain half the chromosome number found in somatic cells?

A Because they are formed by the mitotic division of certain cells in gonads.

B Because they are formed by the meiotic division of certain cells in gonads.

C Because they are formed by the binary fission of certain cells in gonads.

D None of the answers are correct.

Q11: Which of the following correctly describes the chromosomes contained within a human male somatic cell?

A 46 autosomes + YY

B 23 autosomes + XX

C 44 autosomes + XX

D 44 autosomes + XY

E 23 autosomes + XY

Q12: If an embryo has a Y chromosome, what will start to happen around 7 weeks into pregnancy?

A Nervous signals will be generated to stimulate the development of female secondary sexual characteristics.

B The embryo will divide rapidly into a large mass of cells.

C The embryo will implant into the uterus wall.

D Hormones will be released to initiate the formation of the male reproductive organs.

Q13: What is the total number of chromosomes in a normal human body cell?

A 23 pairs of chromosomes

B 46 pairs of chromosomes

C 44 pairs of chromosomes

D 22 pairs of chromosomes

Q14: What is the meaning of the term *autosome*?

A A chromosome that is found in the gametes of a human

B Any chromosome that is not a sex chromosome (X or Y)

C A chromosome that has been automatically replicated, ready for cell division

D A chromosome that is automatically destroyed when damaged

E Any chromosome that has had a section removed

Q15: Which of the following is true about the development of the female foetus?

A The formation of ovaries begins around the 12th week of pregnancy.

B The formation of ovaries begins after a week of pregnancy.

C The formation of ovaries begins after 20 weeks of pregnancy.

D The formation of ovaries will not begin if the foetus lacks a Y chromosome.

Q16: Which of the following is true about the main difference between somatic and sex chromosomes?

A Sex chromosomes exist in four pairs, while somatic chromosomes exist in 22 pairs.

B Somatic chromosomes are different in males and females, while sex chromosomes are similar in both sexes.

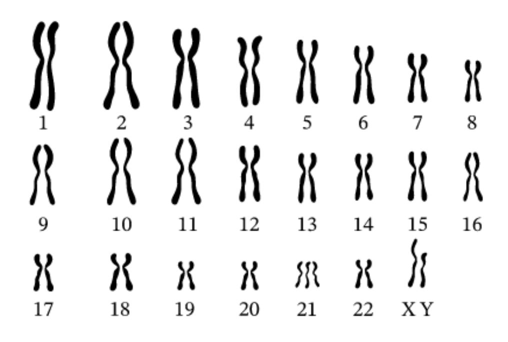
C Sex chromosomes exist in one pair, while somatic chromosomes exist in 24 pairs.

D Somatic chromosomes are similar in both males and females, while sex chromosomes differ between males and females.

Guide Answer:

1	A	11	D
2	B	12	D
3	C	13	A
4	A	14	B
5	50	15	A
6	23	16	D
7	C		
8	C		
9	C		
10	B		

Q1: The image provided shows a karyotype of ______.



A a male with Down syndrome

B a female with Down syndrome

C a male with Turner syndrome

D a female with Turner syndrome

Q2: A karyotype is an image of a person's chromosomes that can be used to determine chromosomal abnormalities.
Which syndrome will likely be developed as a result of the chromosomal abnormality shown in the karyotype provided?

A Down syndrome

B Turner syndrome

C Klinefelter syndrome

Q3: Which of the following is **not** true about Turner's syndrome?

A Only females are affected by Turner's syndrome.

B Patients do not undergo puberty.

C The number of chromosomes in somatic cells of patients with Turner's syndrome is 2n-1.

D Patients suffer from mental retardation.

Q4: During genetic testing after childbirth, if a doctor wants to know whether a newborn has Down syndrome, which part of the newborn's karyotype should he check?

A The autosomes and sex chromosomes

B The sex chromosomes

C The autosomes

D A karyotype would be useless in this case.

Q5: A zygote with a karyotype of 45, OY will .

A develop into a normal male

B not survive

C develop into an individual with Klinefelter syndrome

D develop into an individual with Turner's syndrome

Q6: A normal ovum has been fertilised with a sperm which does not carry a Y chromosome and the resulting zygote contains 23 pairs of chromosomes. The resulting child --------------.

A will be a female with Turner syndrome

B will be a normal female

C will be a normal male

D will suffer from Klinefelter syndrome

Q7: Klinefelter's syndrome is an example of a syndrome caused by chromosomal abnormalities.

Which of the following is a common trait associated with Klinefelter's syndrome?

A Partial deafness

B Myopia

C Cervical cancer

D Infertility

Q8: Which of the following cases does **not** have a number of chromosomes equal to $2n+1$?

A Klinefelter's syndrome

B Down's syndrome

C Turner's syndrome

D None of the answers are correct.

Q9: A case of chromosomal abnormality resulted from the fertilisation of an abnormal ovum (one which has an extra copy of X chromosomes) with a normal sperm. If you know that the fertilising sperm carries a Y chromosome, which of the following statements is correct about this case?

A This case is Turner's syndrome, and the resulting individual is an abnormal female with 45 chromosomes in her somatic cells.

B This case is polyploidy, and the resulting individual is an abnormal female with some male physical features.

C This case is Down's syndrome, and the resulting individual is an abnormal male with 45,XY karyotype.

D This case is Klinefelter's syndrome, and the resulting individual is an abnormal male with 47,XXY karyotype.

Q10: Down syndrome is an example of a syndrome caused by chromosomal abnormalities.

Which of the following is **not** a common trait associated with Down syndrome?

A Intellectual disabilities

B Delayed development of speech

C Heart defects

D Rapid growth during puberty

E Weak muscle tone

Q11: Karyotypes are images of a person's chromosomes that can be used to determine chromosomal abnormalities.

Which syndrome is likely to be caused by the chromosomal abnormality shown in the karyotype provided?

1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16
17 18 19 20 21 22 XXY

A Klinefelter syndrome

B Turner syndrome

C Down syndrome

Q12: The following diagram shows a karyotype of a human embryo.

Which of the following statements about the early formation of this embryo is correct?

A It came by the fertilisation of an ovum with 21 autosomes and a sperm with 23,X karyotype.
B It came by the fertilisation of an ovum with 22 chromosomes and a sperm with 23,Y karyotype.
C It came by fertilisation of an ovum with 22 chromosomes and a sperm with 23 chromosomes.
D It came by the fertilisation of an ovum with 22 autosomes and a sperm with 23 autosomes.

Q13: Individuals with all of the following syndromes have their autosomes arranged in pairs except ------------------ .

A Turner syndrome
B Down syndrome
C Klinefelter syndrome
D None of the answers are correct.

Q14: Down syndrome is an example of a syndrome caused by chromosomal abnormalities.

How is Down syndrome caused?

A Down syndrome is caused by the complete loss of chromosome 21.
B Down syndrome is caused by having three copies of chromosome 21, rather than two.
C Down syndrome is caused by having three copies of an X chromosome, rather than two.
D Down syndrome is caused by structural changes to the X and Y chromosomes.

Q15: The passage provided outlines how chromosomal abnormalities can be caused.

Chromosomal abnormalities can be caused by changes in the ----------- of chromosomes, or a complete loss or ------------ of entire chromosomes.

➢ Which word would be most appropriate to replace the first blank?

A Appearance
B Bonding
C Replication
D Structure

➢ Which word would be most appropriate to replace the second blank?

A Fusion
B Specialization
C Segmentation
D Gain

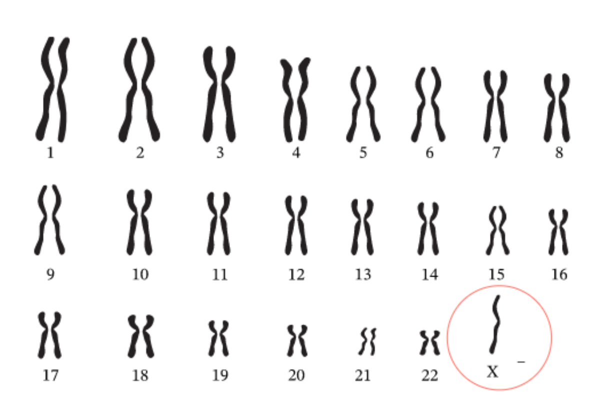
Q16: Which of the following simplified karyotypes represents a female gamete which would produce a male with Down syndrome?

Q17: If an abnormal human ovum which has $n-1$ chromosomes is fertilised by a normal sperm in which the 23rd chromosome is larger than chromosome 9, which of the following could be a result of such fertilization?

A A male with Klinefelter’s syndrome
B A female with down syndrome
C A normal embryo
D A female with Turner’s syndrome

Q18: Karyotypes are images of a person's chromosomes that can be used to determine chromosomal abnormalities.

Which syndrome is likely to be caused by the chromosomal abnormality shown in the karyotype provided?



A Klinefelter syndrome

B Down syndrome

C Turner syndrome

Q19: Which of the following combinations of gametes could produce an offspring composed of abnormal males with 48,XXXY karyotype, normal males, and normal females in equal ratios?

(Female gametes = G1 and G2, male gametes = G3 and G4 , blank = gametes with no sex chromosomes)

A G1: XX, G2:________ ,G3: XY, G4:

B G1: XX, G2:________ ,G3: X, G4: Y

C G1: X, G2: X, G3: XY, G4:__________

D All of the answers are correct.

Q20: A doctor is viewing a karyotype of a foetus. He wants to determine whether the foetus has Klinefelter syndrome. Which part of the karyotype should he check?

A Both the autosomes and sex chromosomes

B The sex chromosomes

C The autosomes

D A karyotype would be useless in this case.

Q21: Klinefelter's syndrome is an example of a syndrome caused by chromosomal abnormalities.

How is Klinefelter's syndrome caused?

A Klinefelter's syndrome is caused by the presence of an extra Y chromosome in cells.
B Klinefelter's syndrome is caused by structural changes in chromosome 21.
C Klinefelter's syndrome is caused by the complete loss of an X chromosome.
D Klinefelter's syndrome is caused by the presence of an extra X chromosome in cells.

Q22: Turner syndrome is an example of a syndrome caused by chromosomal abnormalities.

How is Turner syndrome caused?

A Turner syndrome is caused by the gain of a complete Y chromosome.
B Turner syndrome is caused by a large change in the structure of chromosome 13.
C Turner syndrome is caused by the loss or change in the structure of an X chromosome.
D Turner syndrome is caused by the loss or change in the structure of a Y chromosome.

Q23: Turner syndrome is an example of a syndrome caused by chromosomal abnormalities.

Which of the following is **not** a common trait associated with Turner syndrome?

A Stunted growth
B Delayed puberty
C Severe intellectual disabilities
D Infertility
E Loss of ovary function

Guide Answer:

1	A	11	A	21	D
2	A	12	C	22	C
3	D	13	B	23	C
4	C	14	B		
5	B	15	D,D	25	
6	B	16	D		
7	D	17	D		
8	C	18	C		
9	D	19	A		
10	D	20	B		

Q1: Which of the following best defines an autosome?

A A chromosome that is not a sex chromosome

B A mutation that occurs in the structure of a chromosome

C A chromosome that is not paired with a homologous chromosome

D A chromosome that automatically replicates itself during mitosis

Q2: Which of the following correctly describes the difference between the sizes of the sex chromosomes?

A Y chromosomes are much shorter in length than their homologous X chromosomes.

B X chromosomes are much shorter in length than their homologous Y chromosomes.

C Y and X chromosomes are equal in length.

Q3: A female that is heterozygous for colour blindness and a male that has colour blindness are married. What are the possible genotypes of the females in their offspring?

A $X^B X^B$ and $X^B Y^b$

B $X^B X^b$ and $X^b Y^b$

C $X^B X^b$ and $X^b X^b$

D $X^B X^B$ and $X^B X^b$

Q4: Let us assume that a man is heterozygous for the baldness trait, while his wife is homozygous dominant for that trait. Which of the following is correct about their offspring?

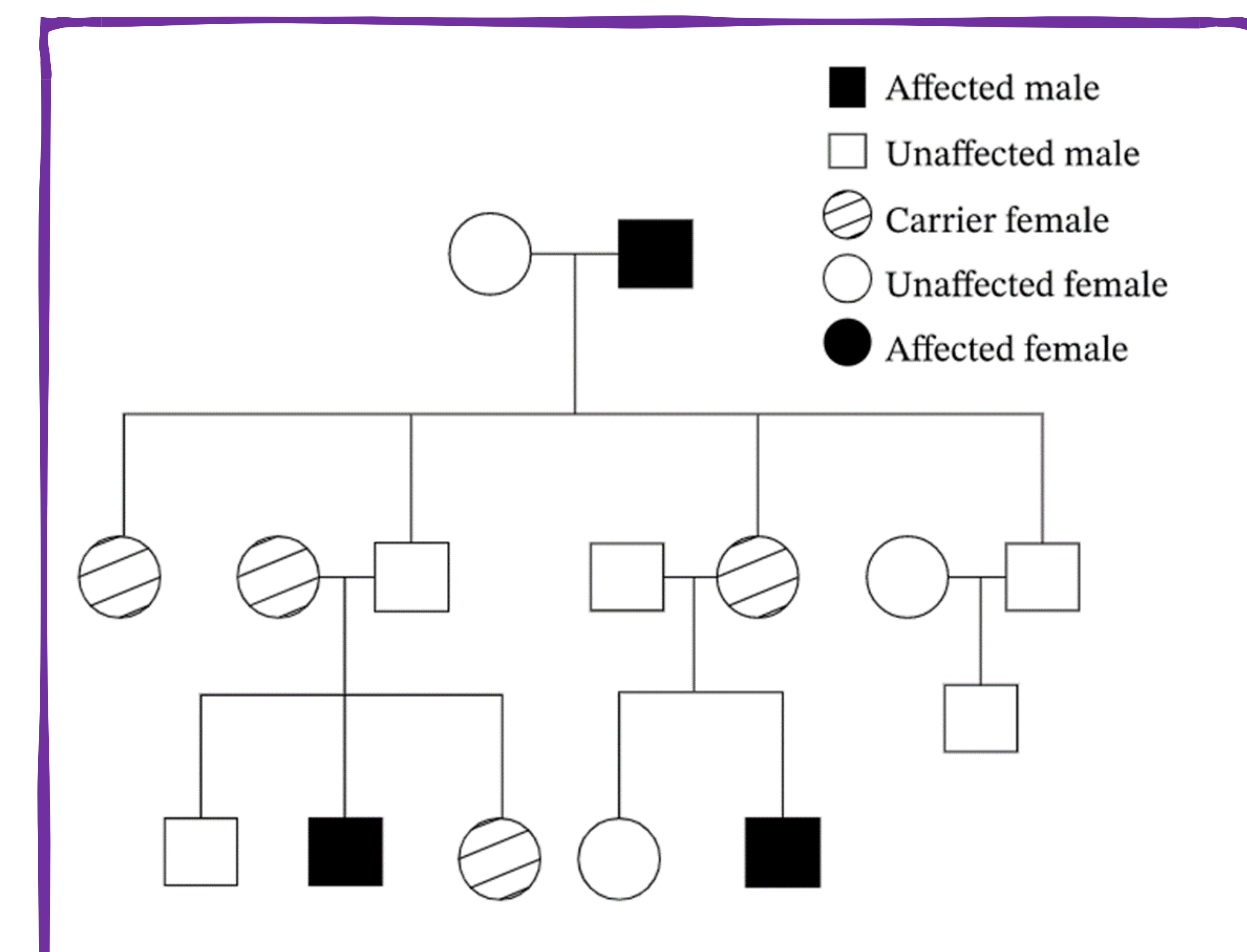
A Only 50% of their sons will be bald.

B They will have sons and daughters with hair loss.

C All their daughters will not have hair loss.

D All their sons and daughters will be healthy.

Q5: The pedigree chart provided shows the inheritance of hemophilia within a family.



- **How does the pedigree chart show that hemophilia is a sex-linked disease?**

A Males are more likely to be sufferers and females to be carriers.
B A person can be a carrier of the allele without being affected by the disease.
C Females are more likely to be sufferers and males to be carriers.

- **How does the pedigree chart show that hemophilia is a recessive disease?**

A A person can be a carrier of the allele without being affected by the disease.
B After two generations of the family, the instances of hemophilia have significantly decreased.
C Males are more likely to be sufferers and females to be carriers.

Q6: Duchenne muscular dystrophy (DMD) is an X-linked recessive condition in humans that causes muscle weakness and wasting.

The allele that correctly produces the dystrophin protein (D) is dominant to the allele that causes DMD (d).

A female with the genotype $X^D X^d$ reproduces with a male with the genotype $X^D Y$.

What is the probability, in percent, that the offspring will be a female without the disease?

[ ] %

Q7: The inheritance of two traits was studied by performing dihybrid test crosses. Regarding trait 1, it was found that both genders had an equal chance of receiving any of the alleles of the father. However, it was observed that the expression of the alleles of trait 1 was different between males and females. On the other hand, fathers could only pass their alleles of trait 2 to their daughters. What can you deduce about the two traits?

A Trait 1 follows a sex-linked inheritance pattern, while trait 2 follows a sex-limited inheritance pattern.
B Trait 1 followed a sex-influenced inheritance pattern, while trait 2 followed a sex-linked inheritance pattern.
C Trait 1 follows a sex-influenced inheritance pattern, while trait 2 follows sex-linked and Mendelian inheritance patterns.
D Both traits follow sex-linked inheritance, but while the trait 1 is dominant, trait 2 is recessive.

Q8: In---------------- ,a recessive trait which is------------------- needs only to be present as a single allele to be expressed.

A females, autosomally linked
B males, sex linked
C males, autosomally linked
D females, sex linked

Q9: A sperm of a father suffering from haemophilia fertilised an ovum that lacks any sex chromosomes. This ovum is from a healthy mother. Which of the following could be the gender and the phenotype of the baby?

A A female suffering from haemophilia
B A female who is a carrier for haemophilia
C A female who is healthy
D A male suffering from haemophilia

Q10: Red-green color blindness is an X-linked recessive condition in humans.

The allele that allows humans to see these colors correctly (B) is dominant to the allele that causes red-green color blindness (b).

A male with color blindness reproduces with a heterozygous female. Which of the following Punnett squares correctly predicts the genotypes of their offspring?

A

Female Gametes / Male Gametes	X^b	Y
X^B	X^BX^b	X^BY
X^B	X^BX^b	X^BY

B

Female Gametes / Male Gametes	X^B	Y
X^b	X^BX^b	X^bY
X^b	X^BX^b	X^bY

C

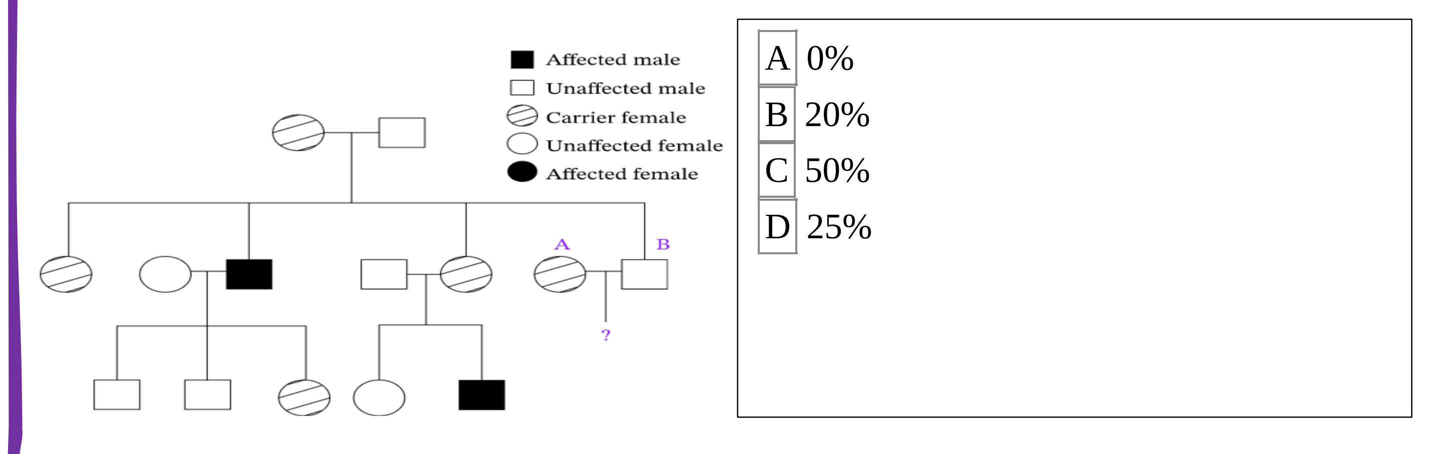
Female Gametes / Male Gametes	X^B	X^b
X^B	X^BX^B	X^BX^b
Y	X^BY	X^bY

D

Female Gametes / Male Gametes	X^B	X^b
X^b	X^BX^b	X^bX^b
Y	X^BY	X^bY

Q11: The pedigree chart provided shows the inheritance of hemophilia within a family.

A and B are a couple planning to have a child. What is the probability, in percent, that the child would be a female carrier of hemophilia?



Q12: The following statement explains why males are more likely to inherit sex-linked diseases:

Males only have one----------------- chromosome, so a recessive allele on this chromosome will always be------------------------ as there is no corresponding allele on a homologous chromosome.

Which word would be most appropriate to replace the first blank?

A autosome

B X

C Y

Which word would be most appropriate to replace the second blank?

A translated

B expressed

C repressed

Q13: The pedigree chart provided shows the inheritance of hemophilia within a family.

What is the most likely genotype of individual B?

Affected male

Unaffected male

Carrier female

Unaffected female

Affected female

A

B

A X^HY^h

B X^hX^h

C X^HY

D X^HX^H

Q14: The gene that causes pattern baldness is located on an autosome. This gene is dominant in males, due to higher levels of testosterone, and is recessive in females. What is this an example of?

A A sex-influenced trait

B A sex-linked trait

C A sex-limited trait

Q15: Hemophilia is an X-linked recessive disease in humans that prevents blood from clotting properly.The allele that allows blood to clot properly (H) is dominant to the allele that causes hemophilia (h).
A female homozygous dominant for these alleles reproduces with a male that has hemophilia. Which of the following Punnett squares correctly predicts the genotypes of their offspring?

A

Female Gametes / Male Gametes	X^h	Y
X^H	X^HX^h	X^HY
X^H	X^HX^h	X^HY

B

Female Gametes / Male Gametes	X^H	X^H
X^h	X^HX^h	X^HX^h
Y	X^HY	X^HY

C

Female Gametes / Male Gametes	X^h	X^h
X^H	X^HX^h	X^HX^h
Y	X^hY	X^hY

D

Female Gametes / Male Gametes	X^H	Y
X^h	X^HX^h	X^hY
X^h	X^HX^h	X^hY

Q16: The gene that causes beards to grow on the faces of humans is located on an autosome, but it is usually only expressed in males and not in females. What is this an example of?

A A sex-influenced trait

B A sex-linked trait

C A sex-limited trait

Q17: Fill in the blanks: If the gene responsible for a characteristic is located on an X or Y--------------- ,the characteristic is termed ---------------- linked.

A allele, autosomally

B allele, genetically

C chromosome, sex

D chromosome, autosomally

Q18: The gene for milk production in humans is located on an autosome. However, the gene is only expressed in females and it is turned off in males. What is this an example of?

A A sex-linked trait

B A sex-limited trait

C A sex-influenced trait

Q19: Hemophilia is an X-linked recessive disease in humans that prevents blood from clotting properly.The allele that allows blood to clot properly (H) is dominant to the allele that causes hemophilia (h).A female heterozygous for these alleles reproduces with a male that does not have the hemophilia allele. Which of the following Punnett squares correctly predicts the genotypes of their offspring?

A

Male Gametes \ Female Gametes	X^h	Y
X^H	X^HX^h	X^HY
X^H	X^HX^h	X^HY

C

Male Gametes \ Female Gametes	X^H	Y
X^H	X^HX^H	X^HY
X^h	X^HX^h	X^hY

B

Male Gametes \ Female Gametes	X^H	X^h
X^H	X^HX^H	X^HX^h
Y	X^HY	X^hY

D

Male Gametes \ Female Gametes	X^H	X^H
X^h	X^HX^h	X^HX^h
Y	X^HY	X^HY

Q20: Fragile X syndrome is an X-linked dominant condition in humans that causes developmental problems.

The allele that causes fragile X syndrome is dominant (R), and the allele that does not is recessive (r).

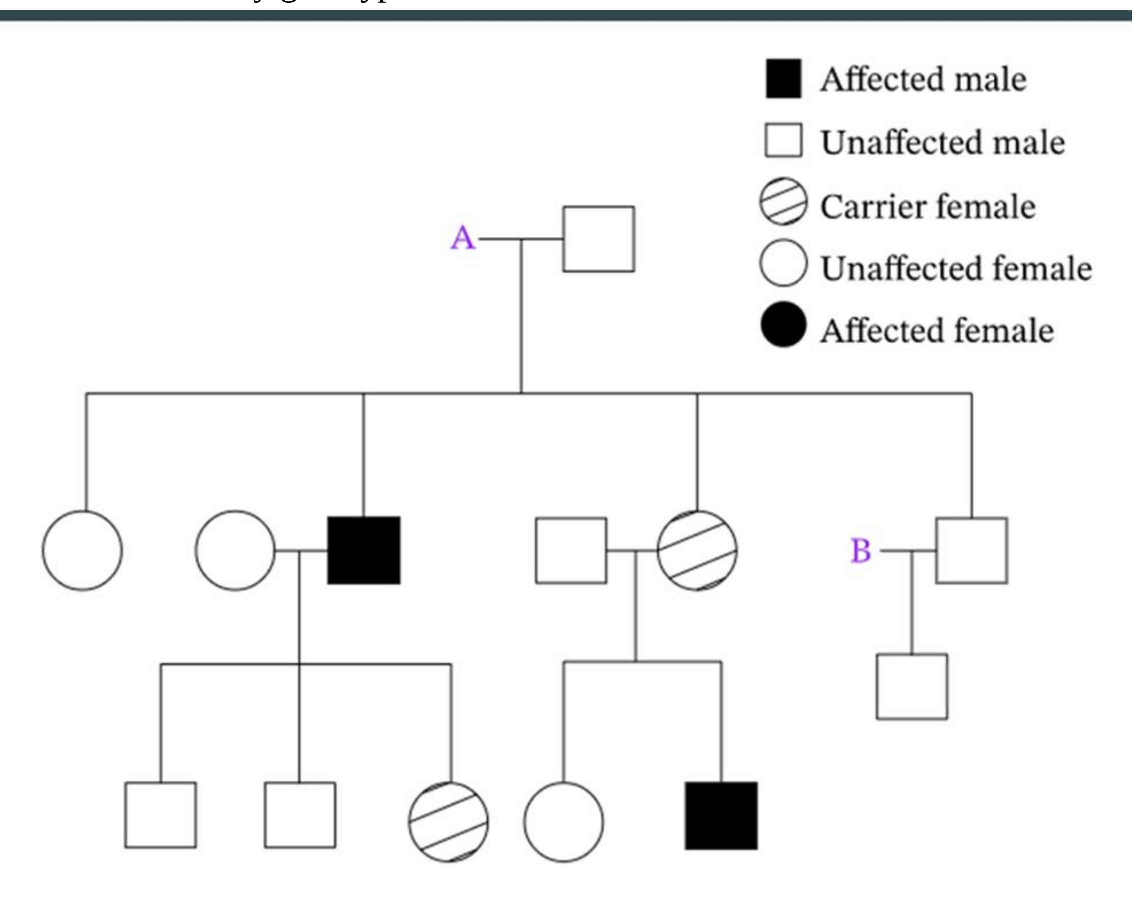
A female with the genotype X^rX^r reproduces with a male with the genotype X^RY.

What is the probability, in percent, that the offspring will be female without fragile X syndrome?

______ %

Q21: The pedigree chart provided shows the inheritance of Duchenne muscular dystrophy (DMD) within a family.

What is the most likely genotype of individual B?



A X^dX^d

B X^dY

C X^DX^D

D X^DY^d

Q22: Red-green color blindness is an X-linked recessive condition in humans.

The allele that allows humans to see these colors correctly (B) is dominant to the allele that causes red-green color blindness (b).

A male that does not have red-green color blindness reproduces with a heterozygous female. Which of the following Punnett squares correctly predicts the genotypes of their offspring?

A

Female Gametes / Male Gametes	X^B	X^b
X^b	X^BX^b	X^bX^b
Y	X^BY	X^bY

C

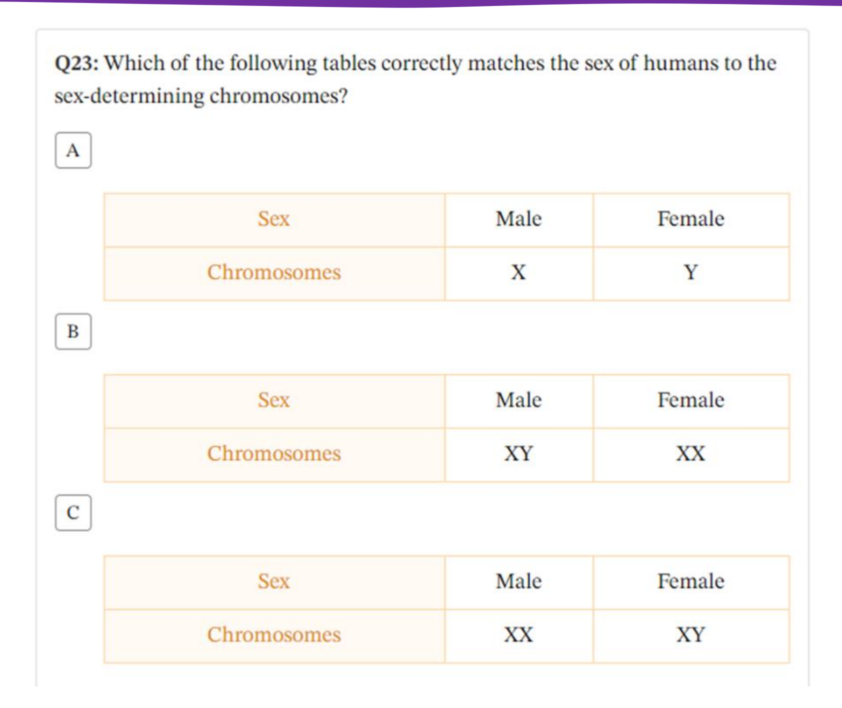
Female Gametes / Male Gametes	X^b	Y
X^B	X^BX^b	X^BY
X^B	X^BX^b	X^BY

B

Female Gametes / Male Gametes	X^B	X^b
X^B	X^BX^B	X^BX^b
Y	X^BY	X^bY

D

Female Gametes / Male Gametes	X^B	Y
X^b	X^BX^b	X^bY
X^b	X^BX^b	X^bY



Q23: Which of the following tables correctly matches the sex of humans to the sex-determining chromosomes?

A

Sex	Male	Female
Chromosomes	X	Y

B

Sex	Male	Female
Chromosomes	XY	XX

C

Sex	Male	Female
Chromosomes	XX	XY

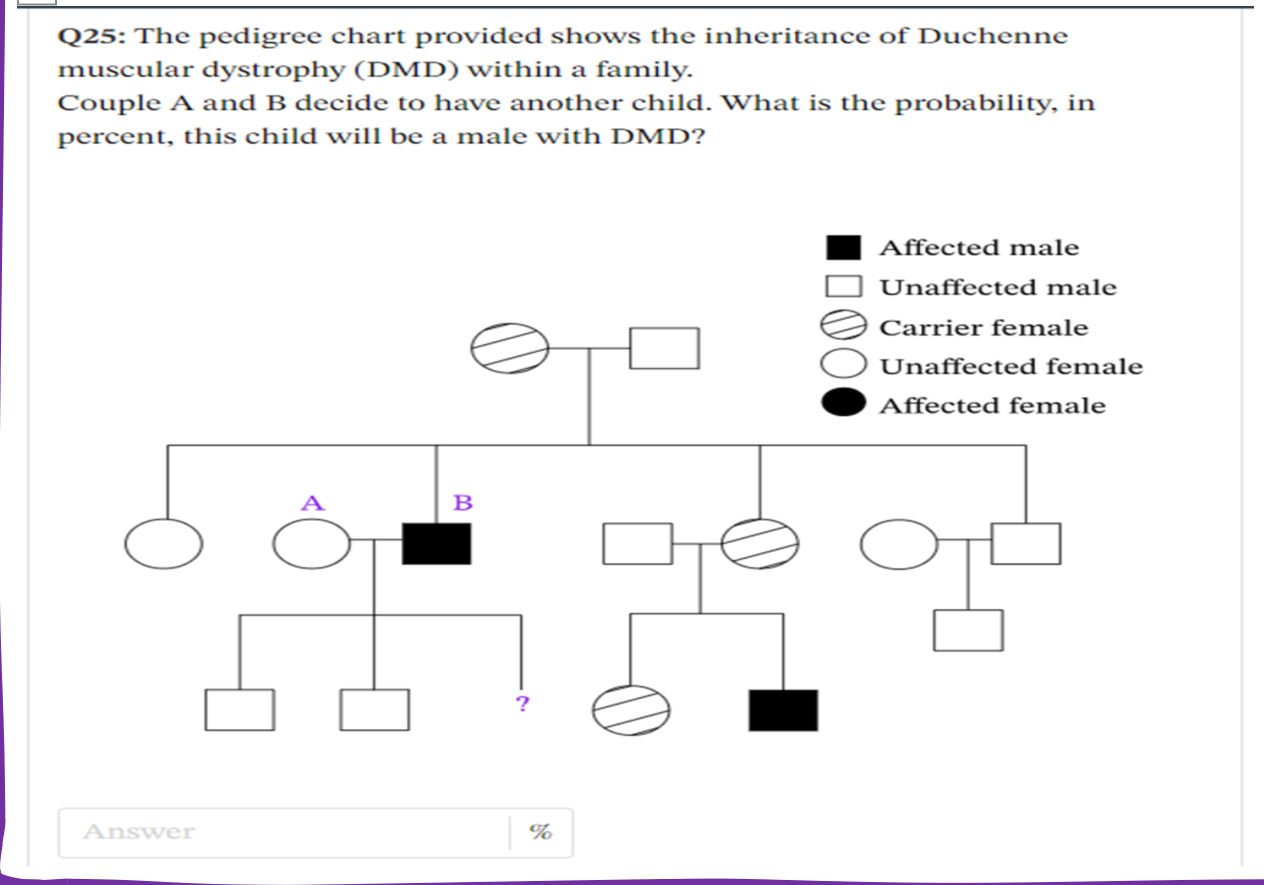
Q24: Autosomes are chromosomes that do not determine the sex of a human. What is meant by autosomal linkage?

A Autosomal linkage occurs when two or more autosomes are structurally altered.

B Autosomal linkage occurs when two or more genes on an autosome merge together.

C Autosomal linkage is the expression of an allele that is located on an X or Y chromosome.

D Autosomal linkage refers to two or more genes being carried on the same autosome.



Q25: The pedigree chart provided shows the inheritance of Duchenne muscular dystrophy (DMD) within a family.
Couple A and B decide to have another child. What is the probability, in percent, this child will be a male with DMD?

Guide Answer:

1	A	11	D	21	C
2	A	12	B,B	22	B
3	C	13	D	23	B
4	B	14	A	24	D
5	A,A	15	B	25	0
6	50	16	C		
7	B	17	C		
8	B	18	B		
9	A	19	B		
10	D	20	0		

Q1: Which of the following best describes the difference between the DNA of bacteria and the DNA of eukaryotes?

A Eukaryotes do not contain any unused sections of DNA, but bacteria do.
B Bacterial DNA contains uracil instead of thymine.
C Eukaryotic DNA contains uracil instead of thymine.
D There are no differences between the DNA of bacteria and eukaryotes.
E Bacteria do not contain any unused sections of DNA, but eukaryotes do.

Q2: From largest to smallest, which of the following is the correct order of the taxonomic levels?

A Kingdom → phylum → class → order → family → species → genus
B Kingdom → phylum → class → order → family → genus → species
C Kingdom → phylum → order → class → genus → family → species
D Phylum → kingdom → class → order → family → genus → species
E Species → kingdom → phylum → class → order → family → genus

Q3: The binomial naming system was developed by Carl Linnaeus. Each organism has a Latin name consisting of two parts, its genus and its species.

- The binomial name for a lion is *Panthera leo*. What is a lion's genus?

A *leo*
B *Panthera*
C Unknown

- The binomial name for a Venus flytrap is *Dionaea muscipula*. What is a Venus flytrap's species?

A *muscipula*
B *Dionaea*
C Unknown

- The binomial name for humans is *Homo sapiens*. What genus do we belong to?

A *Homo*
B Unknown
C *sapiens*

Q4: Which of the following is an assumption scientists make when classifying organisms based on genetic analysis?

A The more DNA two organisms have in common, the more recently they shared a common ancestor.
B The more DNA two organisms have in common, the less recently they shared a common ancestor.
C Organisms have only shared a common ancestor if they have identical DNA.

Q5: What is the significance of taxonomic classification in biology?

A It helps biologists categorise organisms.
B It helps biologists identify new organisms easier.
C It helps biologists study evolution.
D All of the answers are correct.

Q6: What process was used to determine that organisms should be grouped into three domains rather than 5 kingdoms?

A Observational analysis
B Culturing
C Genetic engineering
D Genetic analysis
E Reproduction

Q7: One of the greatest contributions that Linnaeus made to science was his method of naming species. How are binomial names written correctly?

A The first name represents the family and begins with a small letter, and the second name represents the species and begins with a small letter.
B The first name represents the genus and begins with a capital letter, and the second name represents the species and begins with a small letter.
C The first name represents the genus and begins with a capital letter, and the second name represents the family and begins with a small letter.
D The first name represents the species and begins with a capital letter, and the second name represents the genus and begins with a small letter.

Q8: Which of the following scientific terms is used to refer to the science of classification?

A Nomenclature
B Taxonomy
C Diversity
D Phylogeny

Q9: Which of the following is the highest taxonomic rank?

A Kingdom
B Phylum
C Order
D Class

Q10: Assume that two living organisms of the same genus, but different species, interbreed. This gives rise to a hybrid organism. To consider this hybrid organism a species, it must be ------------ .

A significantly different in its morphology than its parents
B significantly different in its anatomy than its parents
C able to mate and produce fertile offspring
D All of the above

Q11: Which of the following best describes a species?

A A species is a group of similar organisms that can reproduce.
B A species is a group of organisms that had a common ancestor in the last millennium.
C A species is a large group of organisms that inhabit the same ecological space.
D A species is a group of organisms that can breed to produce fertile offspring.
E A species is a group of organisms that are genetically identical.

Q12: Which of the following statements is **not** true about mules?

A Mules are produced from the mating of a female donkey and a male horse.
B Mules have difficulty making sperms.
C Mules are unable to produce a new generation.
D Mules have difficulty producing eggs.

Q13: Which of the following correctly states the 5 kingdoms?

A Animals, plants, fungi, protists, prokaryotes
B Animals, plants, fungi, bacteria, prokaryotes
C Animals, plants, fungi, birds, microorganisms
D Animals, plants, algae, protists, prokaryotes
E Animals, plants, fungi, protists, viruses

Q14: Linnaeus established the practice of ------------- and so the scientific name of a cat should be written as -----------------------------.

A IUPAC nomenclature, *Felis domesticus*
B binomial nomenclature, *Felis Domesticus*
C IUPAC nomenclature, *FELIS DOMESTICUS*
D binomial nomenclature, *Felis domesticus*

Q15: Which of the following is the correct definition of classification?

A Classification is the organization of living things into groups that have similar features.
B Classification is the organization of living things into groups that have different features.
C Classification is the organization of dead things into groups that have similar features.
D Classification is the organization of organisms into large, mixed groups.
E Classification is the organization of organisms into groups that inhabit the same area.

Q16: Which of the following is **not** correct about the genetics of the three domains?

A Bacteria have genes with no unused sections of DNA.
B Archaea have genes with unused sections of DNA.
C Archaea have cells that contain a nucleus.
D Eukaryota have cells that contain a nucleus.
E Bacteria cells do not have a nucleus.

Q17: Biological classification systems have changed over time. Previously, biologists used artificial classification to group organisms, but natural classification methods are now much more common.

- ➢ Which of the following describes artificial classification?

A Grouping organisms together using observable characteristics

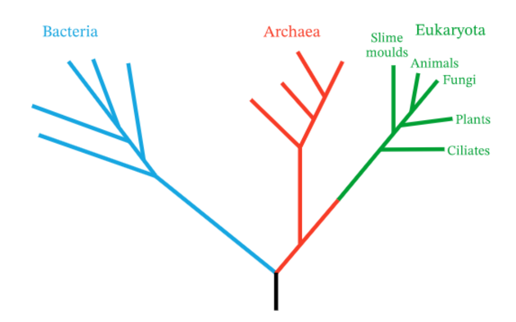
B Using DNA sequencing to group organisms based on evolutionary links

➢ Which of the following describes natural classification?

A Grouping organisms together using observable characteristics

B Using DNA sequencing to group organisms based on evolutionary links

Q18: The diagram given shows a basic outline of the three domains.



➢ Which of the following is correct about the evolution of the domains?

A Archaea and Bacteria evolved from a different common ancestor than that of Eukaryota.

B Archaea and Eukaryota shared a common ancestor more recently than Eukaryota and Bacteria.

C Bacteria and Eukaryota shared a common ancestor more recently than Eukaryota and Archaea.

➢ Which of the following is correct about the evolution of Eukaryota?

A Fungi and plants shared a common ancestor more recently than fungi and animals.

B Fungi and animals shared a common ancestor more recently than fungi and plants.

C Fungi and plants evolved from a different common ancestor than animals.

Q19: Which of the following is **not** true of species?

A In the binomial system of nomenclature, the name of a species starts with a small letter.

B A species is a group of organisms that are able to interbreed naturally and produce fertile offspring.

C In biology, *species* is a term given to any group of individuals that have similar morphological features.

D Species is a ranking found below the genus in the taxonomic hierarchy.

Q20: Aristotle developed the first system of classification of animals. How did Aristotle classify animals?

A Aristotle classified animals on the basis of the presence or absence of endoskeleton.
B Aristotle classified animals on the basis of the presence or absence of exoskeleton.
C Aristotle classified animals on the basis of the presence or absence of red blood.
D Aristotle classified animals on the basis of the presence or absence of nerve cells.

Q21: Different types of food mould belong to various phyla of fungi. The following table outlines three types of fungi, their scientific names, and the orders they are classified into.

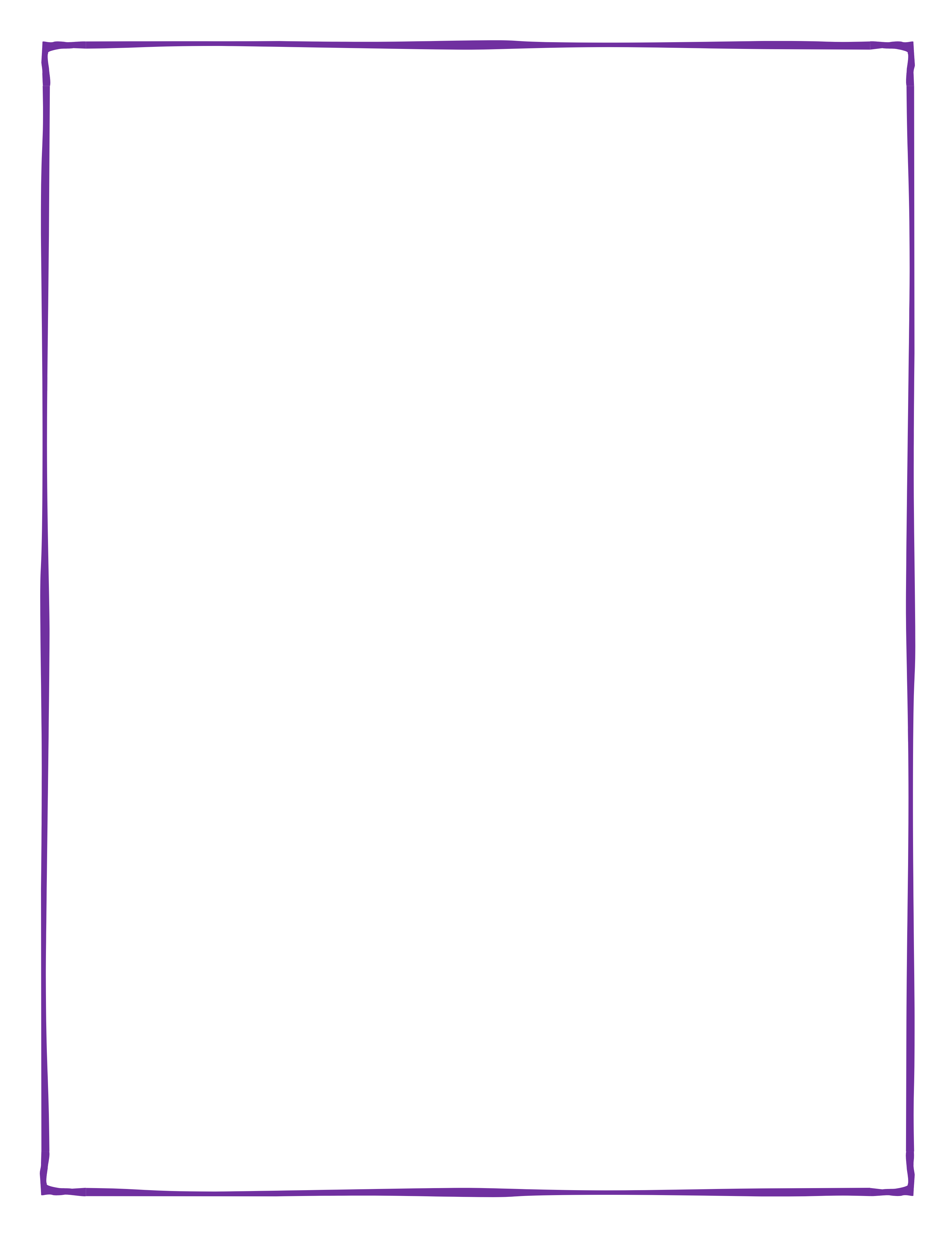
Fungus	Scientific name	Order
A	*Rhizopus nigricans*	Mucorales
B	*Rhizopus oligosporus*	Mucorales
C	*Penicillium digitatum*	Eurotiales

If you know that *Penicillium digitatum* belongs to the family Trichocomaceae, which of the following statements about those three types of fungi is correct?

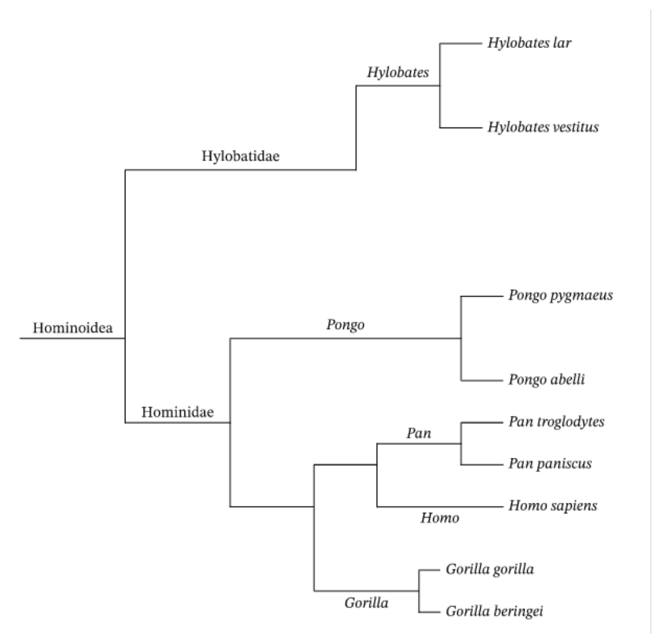
A Fungi A and B belong to the same family, which is not Trichocomaceae.
B Fungi A and B belong to the same genus but to different families.
C Fungus A belongs to the family Trichocomaceae.
D Fungi A, B, and C are different species belonging to the family Trichocomaceae.

Guide Answer:

1	E	11	D	21	A
2	B	12	A		
3	B,A,A	13	A		
4	A	14	D		
5	D	15	A		
6	D	16	C		
7	B	17	A,B		
8	B	18	B,B		
9	A	19	C		
10	C	20	C		



Q1: The diagram provided shows an incomplete evolutionary tree of primates belonging to the Hominoidea superfamily. What level of the taxonomic hierarchy is represented by Hylobatidae and Hominidae?



A Genus

B Species

C Family

D Suborder

E Class

Q2: There are two major types of classification: artificial and phylogenetic.

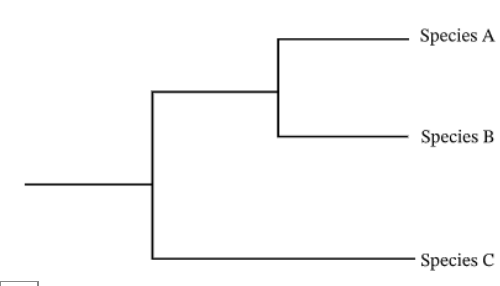
A student observes the organism in the picture and classifies it into the phylum Arthropoda because it has a segmented body and an exoskeleton. What type of classification is this an example of?



A Artificial

B Phylogenetic

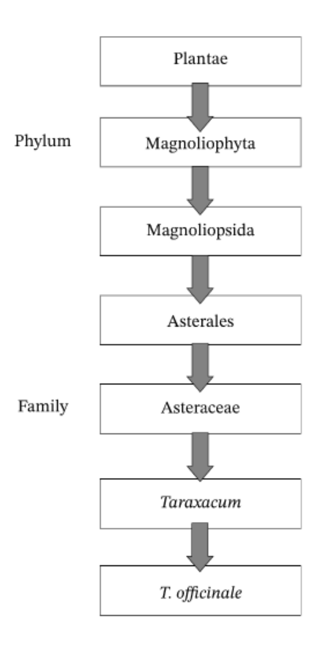
A scientist discovers that species A and B shared a common ancestor more recently than species A and C, and the scientist classifies them into groups as shown in the diagram. What type of classification is this an example of?



A Phylogenetic

B Artificial

Q3: The taxonomic hierarchy of a dandelion is provided.



➢ What genus does a dandelion belong to?

A Plantae

B Magnoliopsida

C *Taraxacum*

D *officinale*

➢ What kingdom does a dandelion belong to?

A Asterales

B *Taraxacum*

C Plantae

D Magnoliopsida

Q4: Complete the statement using the correct words: A species is a group of individuals that share similar ------------ and can mate with each other to produce ----------------- offspring.

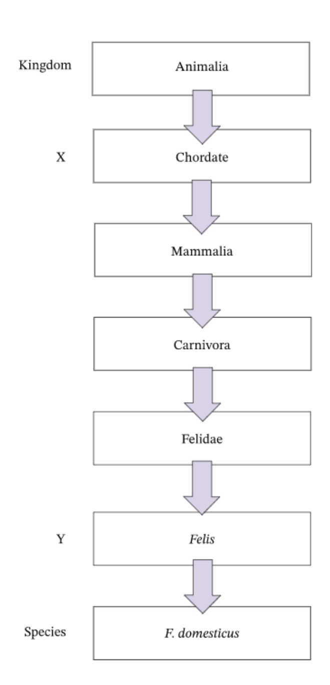
A	characteristics, fertile
B	genes, many
C	features, living
D	mutations, fertile

Q5: A female tiger and a male lion are mated in a zoo. Which of the following is correct about the cub they produce?



A	The cub will be able to reproduce successfully with both lions and tigers.
B	The cub will be classified in a different genus than both of its parents.
C	The cub will be sterile and unable to have offspring of its own.
D	The cub will not survive longer than 4-5 years.

Q6: The taxonomic hierarchy for a domestic cat is provided in the diagram.



➢ Which taxonomic rank is represented by X?

A Class
B Order
C Genus
D Phylum

➢ Which taxonomic rank is represented by Y?

A Family
B Phylum
C Genus
D Order

Q7: The binomial naming system provides each organism with two names. For example, the binomial name for humans is *Homo sapiens*.

➢ In the binomial system, what taxonomic rank does the first name represent?

A Kingdom
B Class
C Genus
D Phylum
E Species

➢ In the binomial system, what taxonomic rank does the second name represent?

A Phylum
B Genus
C Order
D Species
E Class

Q8: Which of the following best defines natural (phylogenetic) classification?
A The classification of organisms into groups according to their visible and current features (e.g., number of legs)
B The classification of organisms into groups based on evolutionary relationships (e.g., members of the same genus sharing a more recent common ancestor than members of the same phylum)

Q9: What is the relation between the number of organisms in a certain taxonomic group and the specificity of this group?

A All taxonomic groups have the same number of organisms.
B The specificity of a taxonomic group has no effect on the number of organisms in that taxonomic group.
C The number of organisms in a taxonomic group is inversely proportional to the specificity of that group.
D The number of organisms in a taxonomic group is directly proportional to the specificity of that group.

Q10: Which of the following is **not** an advantage of classifying organisms into taxonomic hierarchies?

A Classifying organisms can be used to determine the genomes of extinct species.
B Classifying organisms helps determine what species a newly discovered organism could belong to.
C Classifying organisms helps predict the shared characteristics of a group.
D Classifying organisms can be used to determine evolutionary links between species.

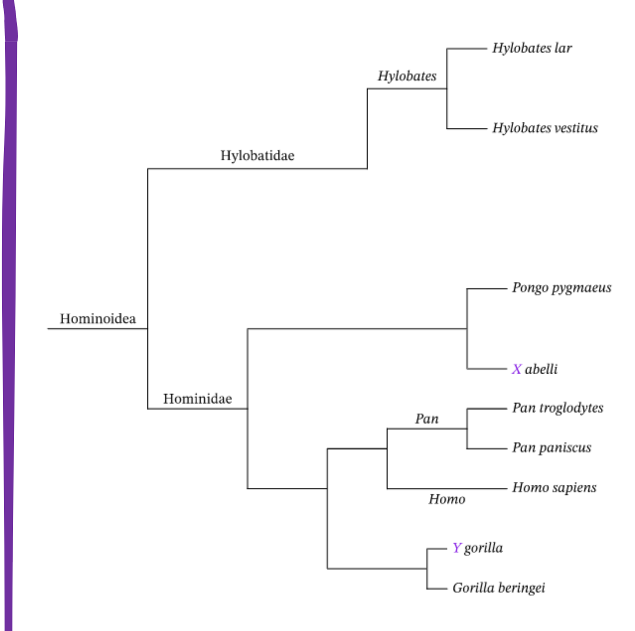
Q11: Which of the following best defines artificial classification?

A The classification of organisms into groups according to their visible and current features (e.g., number of legs)
B The classification of organisms into groups based on evolutionary relationships (e.g., members of the same genus sharing a recent common ancestor)

Q12: Which of the following is the correct order of taxonomic levels from broadest to narrowest?

A Class, family, genus, species
B Family, class, species, genus
C Family, class, genus, species
D Genus, family, class, species

Q13: The diagram provided shows an incomplete evolutionary tree of existing primates belonging to the Hominoidea superfamily.



➢ What word should replace X?

A *Homo*
B *Hominidae*
C *Abelli*
D *Pongo*

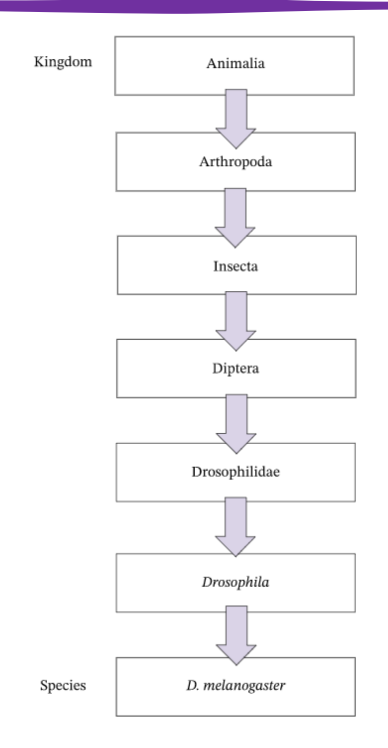
➢ What word should replace Y?

A *Hominidae*
B *Gorilla*
C *Homo*
D *Pan*

Q14: Which of the following statements is **not** correct about the taxonomic hierarchy?

A A kingdom is a higher rank than a phylum.
B A family is a lower taxonomic rank than a class.
C A species includes a number of different families.
D A class includes a number of different orders.
E A genus includes a number of different species.

Q15: The taxonomic hierarchy of a fruit fly is provided.



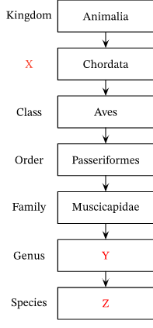
➢ What genus does a fruit fly belong to?

A	Diptera
B	Arthropoda
C	*Drosophila*
D	Drosophilidae
E	Insecta

➢ What phylum does a fruit fly belong to?

A	Diptera
B	Insecta
C	*Drosophila*
D	Arthropoda
E	Drosophilidae

Q16: An incomplete taxonomic hierarchy of a robin (*Erithacus rubecula*) is provided in the diagram.



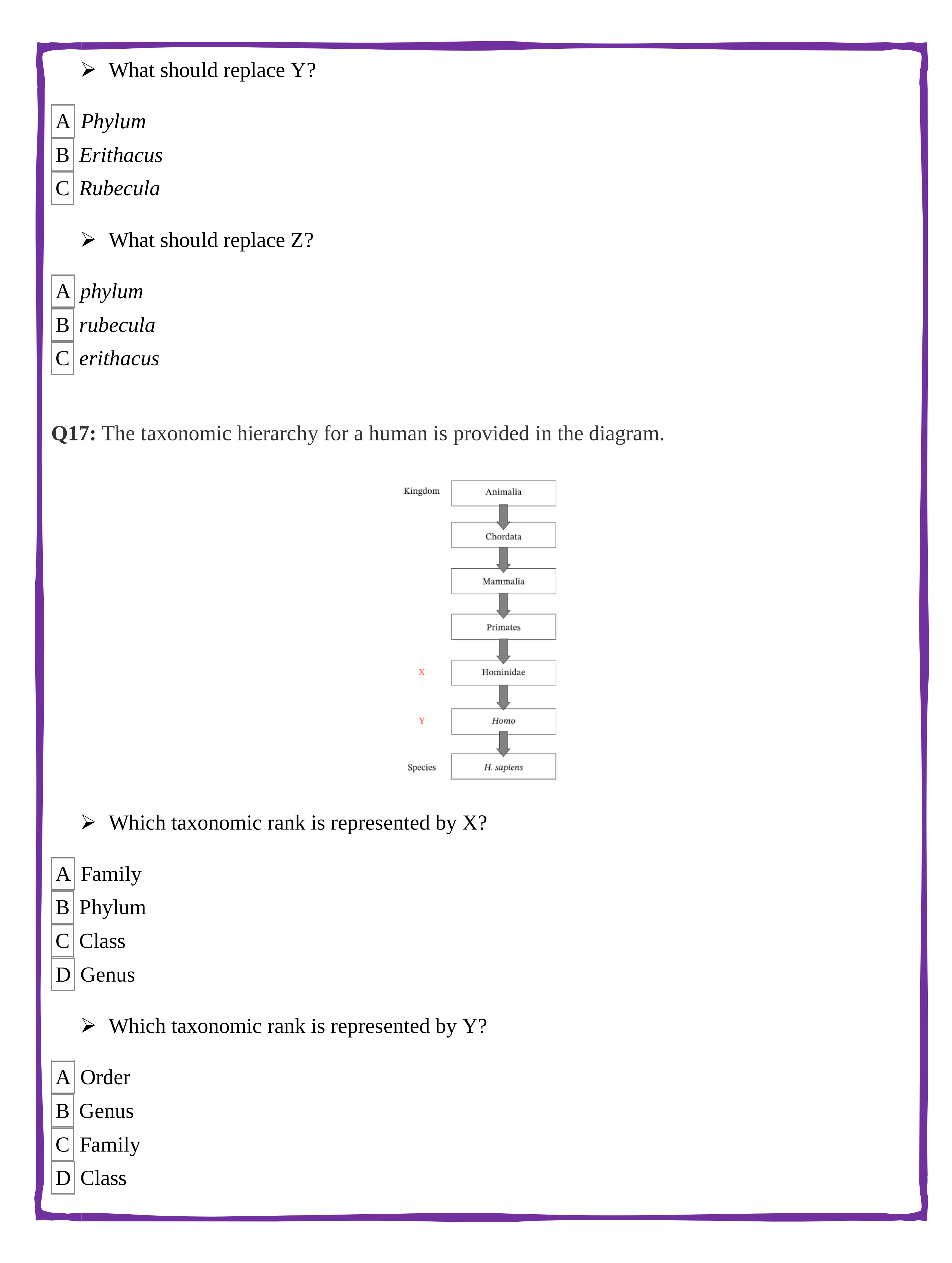
- What should replace Y?

A *Phylum*
B *Erithacus*
C *Rubecula*

- What should replace Z?

A *phylum*
B *rubecula*
C *erithacus*

Q17: The taxonomic hierarchy for a human is provided in the diagram.



- Which taxonomic rank is represented by X?

A Family
B Phylum
C Class
D Genus

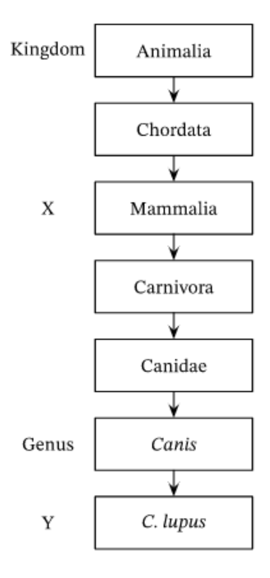
- Which taxonomic rank is represented by Y?

A Order
B Genus
C Family
D Class

Q18: Which of the following is the correct order of taxonomic hierarchy, from largest to smallest?

A Kingdom → phylum → class → order → family → genus → species
B Phylum → class → kingdom → order → family → genus → species
C Kingdom → class → order → family → phylum → genus → species
D Kingdom → family → genus → phylum → class → order → species
E Phylum → class → kingdom → order → family → species → genus

Q19: The taxonomic hierarchy for a gray wolf is provided in the diagram.



- Which taxonomic rank is represented by X?

A Family
B Class
C Phylum
D Species

- Which taxonomic rank is represented by Y?

A Species
B Family
C Order
D Class

Q20: Which scientist proposed the binomial naming system for living organisms?

A Jean-Baptiste Lamarck
B Charles Darwin
C Carl Linnaeus
D Alfred Russel Wallace

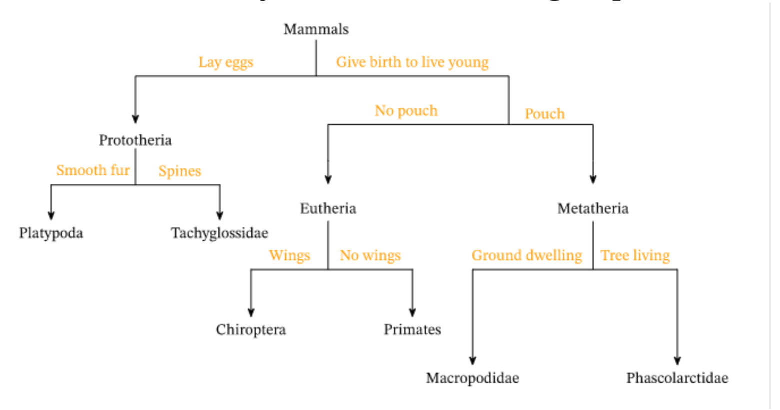
Q21: Domestic dogs and grey wolves can interbreed and produce fertile offspring (wolf dog). In light of this statement, which of the following do domestic dogs and grey wolves share?

A Genus and species
B Species only
C Order, family, genus, and species
D Family, genus, and species

Guide Answer:

1	C	11	A	21	C
2	A,A	12	A		
3	C,C	13	D,B		
4	A	14	C		
5	C	15	C,D		
6	D,C	16	B,B		
7	C,D	17	A,B		
8	B	18	A		
9	C	19	B,A		
10	A	20	C		

Q1: A simple dichotomous key used to identify different groups of mammals is provided. An organism that does not give birth to live young and is covered in smooth fur is discovered. Using this dichotomous key, determine which group it is most likely to belong to.



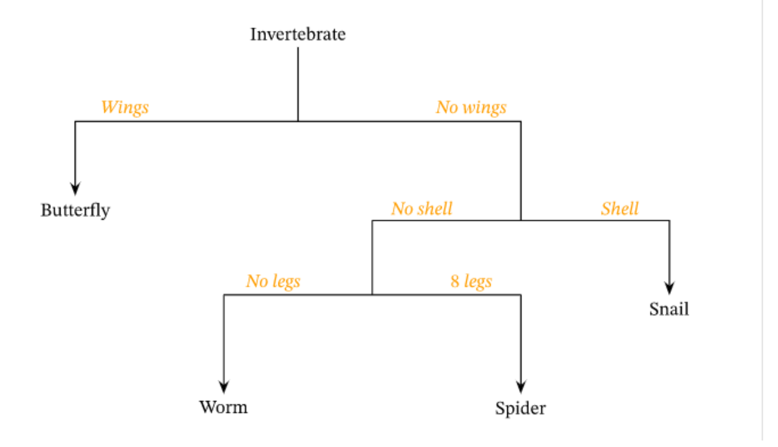
A Tachyglossus

B Chiroptera

C Platypoda

D Macropodidae

Q2: A simple dichotomous key used to identify invertebrates commonly found in gardens is provided. A child finds an organism that does not have a shell but has wings. Using this dichotomous key, determine which organism it is most likely to be.



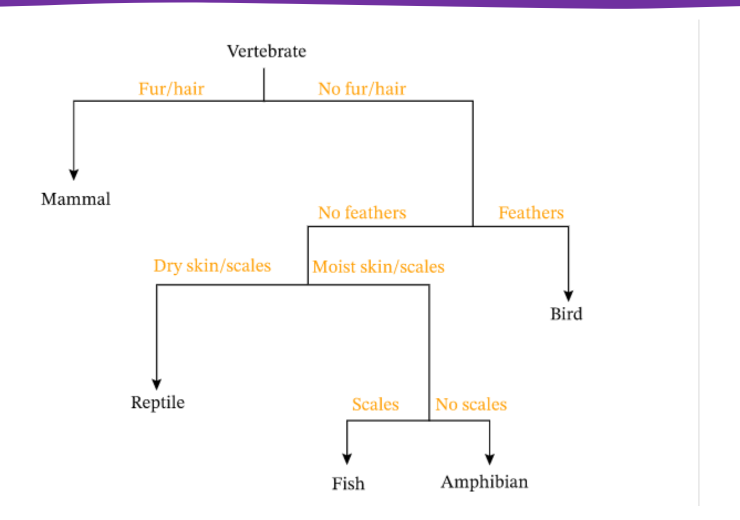
A Butterfly

B Spider

C Snail

D Worm

Q3: A simple dichotomous key used to identify groups of vertebrates is provided. An organism that has no fur, feathers **nor** scales is discovered. Using this dichotomous key, determine which group it is most likely to belong to.



A Fish

B Reptiles

C Amphibians

D Mammals

E Birds

Q4: The following statement explains what a dichotomous key is: A dichotomous key is a series of ,grouped into pairs, designed to identify an organism by its .

- Which word is most appropriate to replace the first blank?

A Descriptions

B Organisms

C Taxonomic ranks

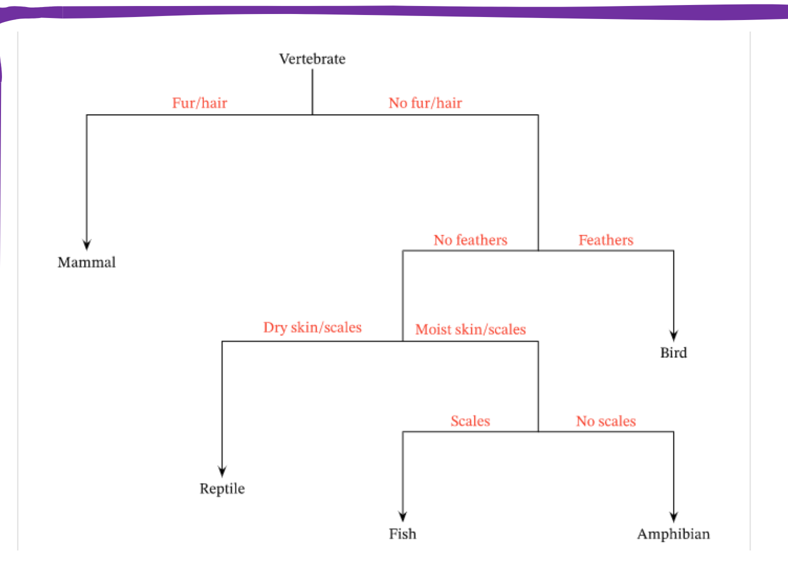
- Which word is most appropriate to replace the second blank?

A Peers

B Characteristics

C Genetics

Q5: A simple dichotomous key used to identify groups of vertebrates is provided. An organism that has no fur or feathers but is covered in dry scales is discovered. Using this dichotomous key, determine which group it is most likely to belong to.



A Amphibians

B Fish

C Birds

D Reptiles

E Mammals

Q6: What does this statement best describe?

It is a way of identifying organisms using a series of two alternative descriptions.

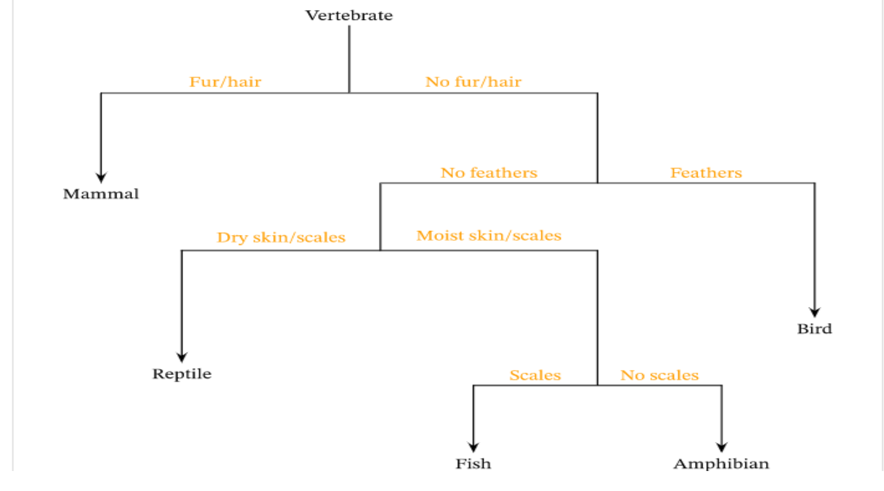
A Binomial nomenclature

B Taxonomic ranking

C The Aristotelian system

D A dichotomous key

Q7: A simple dichotomous key used to identify groups of vertebrates is provided. An organism that does not have fur but has feathers is discovered. Using this dichotomous key, determine which group it is most likely to belong to.



A Reptiles

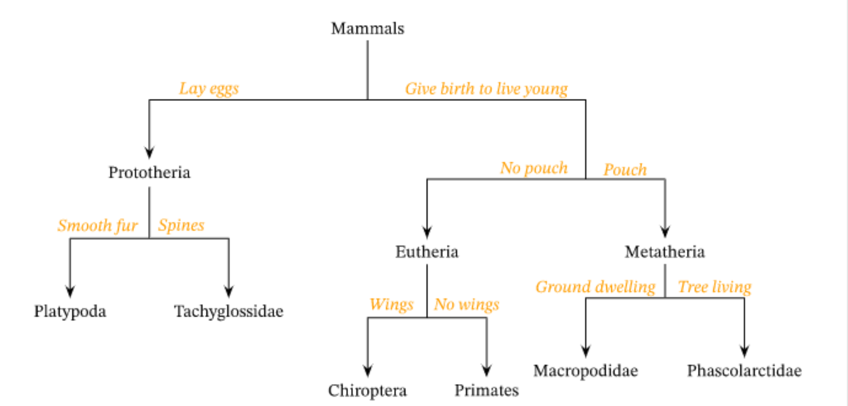
B Amphibians

C Mammals

D Fish

E Birds

Q8: A simple dichotomous key used to identify different groups of mammals is provided. An organism that initially keeps its live young in a pouch and spends the majority of its time on the ground is discovered. Using this dichotomous key, determine which group it is most likely to belong to.



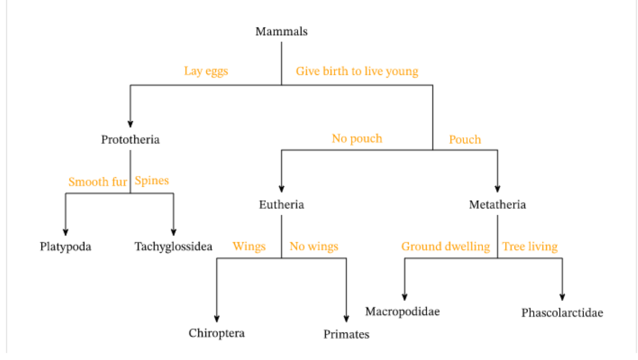
A Phascolarctidae

B Macropodidae

C Platypoda

D Chiroptera

Q9: A simple dichotomous key used to identify different groups of mammals is provided. An organism that gives birth to live young but does not possess a pouch and has no wings is discovered. Using this dichotomous key, determine which group it is most likely to belong to.



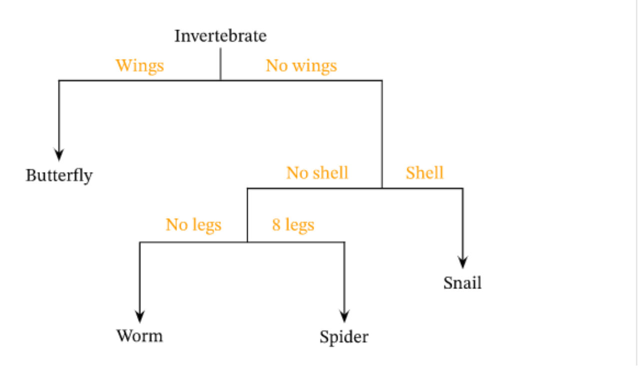
A Chiroptera

B Primates

C Platypoda

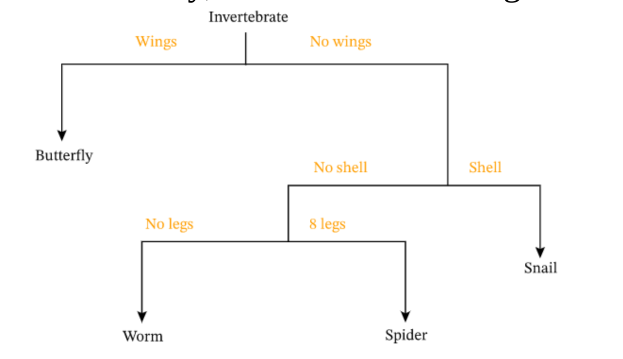
D Tachyglossus

Q10: A simple dichotomous key used to identify invertebrates commonly found in gardens is provided. A child finds an organism that has no wings, no shell, and 8 legs. Using this dichotomous key, determine which organism it is most likely to be.



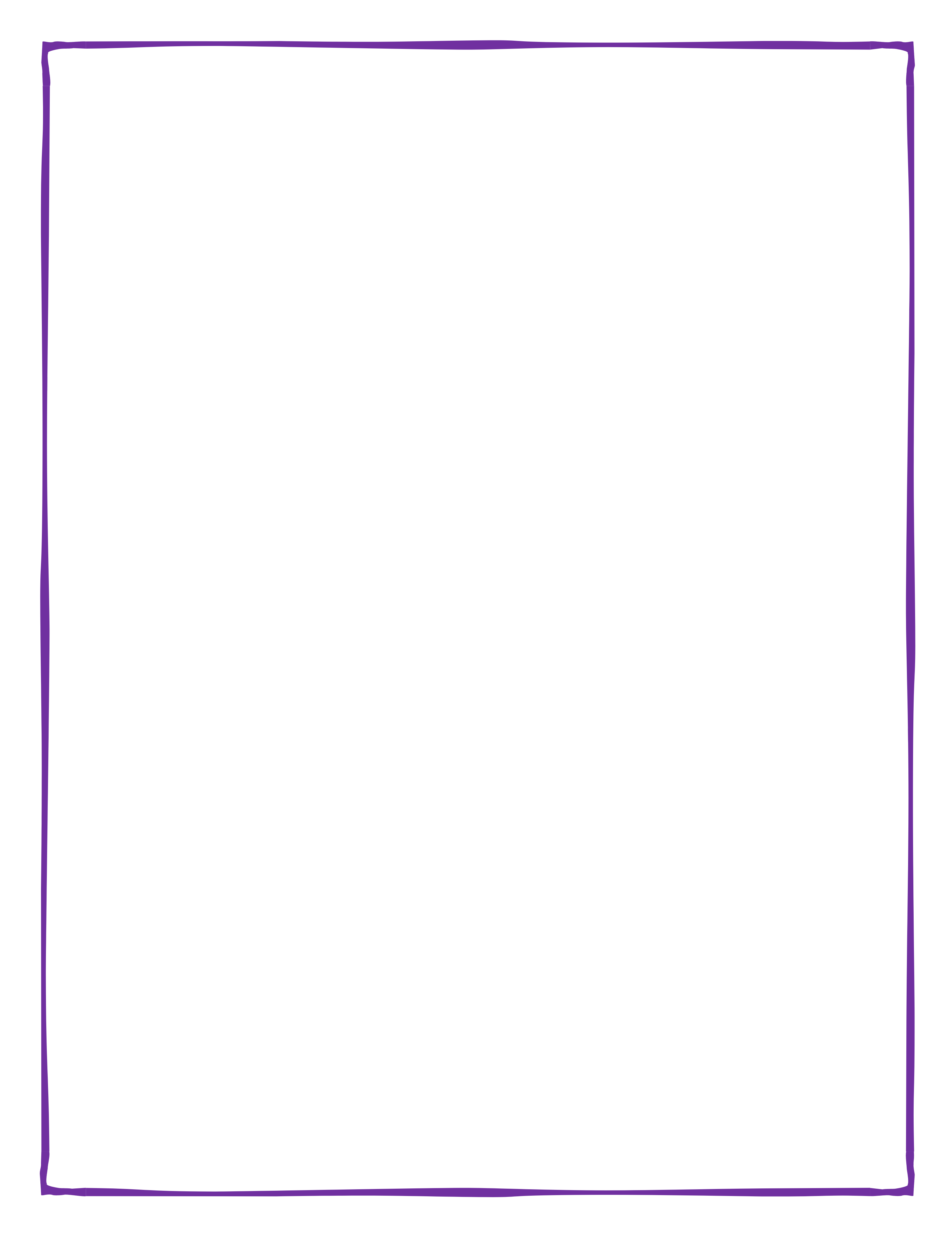
A	Worm
B	Spider
C	Snail
D	Butterfly

Q11: A simple dichotomous key used to identify invertebrates commonly found in gardens is provided. A child finds an organism that has no legs and no wings but has a shell. Using this dichotomous key, determine which organism it is most likely to be.



Guide Answer:

1	C	11	C
2	A		
3	C		
4	A,B		
5	D		
6	D		
7	E		
8	B		
9	B		
10	B		



Q1: Robert H. Whittaker classified organisms into 5 kingdoms. What were these kingdoms?

A Eukaryota, Plantae, Animalia, Aves, Reptilia
B Monera, Protista, Fungi, Plantae, Animalia
C Chordata, Fungi, Plantae, Animalia, Protostomes
D Mammalia, Aves, Reptilia, Amphibia, Fish
E Monera, Protista, Fungi, Plantae, Mammalia

Q2: Which of the following correctly compares Linnaeus's and Whittaker's systems of classification?

A Whittaker had more biological and technological knowledge when creating his system of classification.
B Linnaeus had more biological and technological knowledge when creating his system of classification.

Q3: Which of the following is **not** a true example of a living organism?

A Prions
B *Nostoc*
C Dinoflagellates
D Malaria parasites
E Both prions and dinoflagellates

Q4: Which of the following best explains why coronavirus is **not** classified in any of the five kingdoms of Whittaker's system of classification?

A Coronavirus is a new type of living organisms that we still do not have enough information about to be able to classify it within the kingdoms of Whittaker's system of classification.
B Unlike all other classified organisms, coronavirus was discovered years after Whittaker's death.
C Coronavirus, like all other types of viruses, has not been completely classified as a living or nonliving organism.
D Coronavirus cannot be classified with the other similar prokaryotes because it is a unicellular prokaryote that shares some characteristics with protists.

\

Q5: Why is it difficult to classify viruses into Whittaker's system of classification?

A Because Whittaker's system did not include classification of microorganisms

B Because they have very few defining features

C Because they were discovered after Whittaker created his system of classification

D Because they share characteristics with both Kingdom Plantae and Kingdom Fungi

E Because they are generally considered to be nonliving

Q6: Which of the following **cannot** be classified into a kingdom in Whittaker's system of classification?

A Humans

B Bacteria

C Yeast

D Prions

E Archaea

Q7: Carl Linnaeus classified organisms into two distinct groups. What were these groups?

A The animal kingdom and the plant kingdom

B Living and nonliving

C Kingdom Mammalia and kingdom Plantae

D Artificial and natural

E Invertebrates and vertebrates

Guide Answer:

1	B
2	A
3	A
4	C
5	E
6	D
7	A

Q1: Which of the following correctly describes the difference between the environments of Archaebacteria and Eubacteria?

A Many species of Eubacteria are extremophiles and live in extreme environments, whereas Archaebacteria are found in all environments.

B Many species of Archaebacteria are extremophiles and live in extreme environments, whereas Eubacteria are found in all environments.

Q2: By what method do organisms belonging to kingdoms Archaebacteria and Eubacteria commonly reproduce?

A Binary fission

B Meiosis

C Production of spores

D Mitosis

Q3: A unicellular organism has been discovered. The organism usually resides in the human gut and requires access to oxygen to survive. Which kingdom, Archaebacteria or Eubacteria, is this organism most likely to belong to?

A Archaebacteria

B Eubacteria

Q4: Fill in the blank:

The genetic material of organisms in the kingdom Monera is largely contained within a circular ---.

A nucleus

B nucleosome

C gene

D chromosome

Q5: A bacterial cell possesses -------,but lacks --------- and ----------.

A an endoplasmic reticulum, ribosomes, mitochondria

B ribosomes, an endoplasmic reticulum, mitochondria

C plastids, an endoplasmic reticulum, mitochondria

D a cell wall, ribosomes, plastids

Q6: In 1977, biologist Carl Woese proposed a new six-kingdom system of classification that split kingdom Monera into two new kingdoms. What two kingdoms was kingdom Monera split into?

A Eubacteria and Archaebacteria
B Eubacteria and Prokaryota
C Protista and Prokaryota
D Protista and Archaebacteria

Q7: Which of the following correctly describes the difference between the cell walls of Archaebacteria and Eubacteria?

A Eubacteria have cell walls that are composed of peptidoglycan, which is not present in Archaebacteria cell walls.
B Archaebacteria have cell walls that are composed of peptidoglycan, which is not present in Eubacteria cell walls.

Q8:

Fill in the blank:

The majority of organisms belonging to kingdom Monera are -------------.

A unicellular
B bicellular
C multicellular
D noncellular

Q9: Bacteria are found in every habitat on Earth. What are the forms in which bacteria live?

A They can live in colonies only.
B They can live individually or in colonies.
C They can live individually only.
D They can live in association with other living organisms only.

Q10: Which of the following is a characteristic of an organism belonging to kingdom Monera?

A Most of these organisms are large and multicellular.
B The cells of these organisms contain a cellulose cell wall.

C These organisms only reproduce sexually.
D The cells of these organisms do not contain a membrane-bound nucleus.

Q11: A unicellular organism has been discovered. The organism is adapted to survive in hot springs that have very high temperatures and low pH levels. Which kingdom, Archaebacteria or Eubacteria, is this organism most likely to belong to?

A Archaebacteria
B Eubacteria

Q12: Fill in the blank:

Almost all Eubacteria and Archaebacteria posses ----------------.

A a circular nucleus
B extended cilia
C a cellulose membrane
D a cell wall

Guide Answer:

1	B	11	A
2	A	12	D
3	B		
4	D		
5	B		
6	A		
7	A		
8	A		
9	B		
10	D		

Q1: Patients who are infected with malaria usually feel very sick with high fevers and shaking chills. Which of the following is true about the parasite species that cause malaria in humans?

A They lack cilia.

B They belong to class Sarcodina.

C They infect humans with sleeping sickness too.

D They possess two types of flagella.

Q2: *Euglena* is a genus of unicellular organisms that belong to the kingdom Protista. Which of the following is true about members of the genus *Euglena*?

A They have glass-like cell walls containing silica.

B They move by the means of pseudopodia.

C They have no means of locomotion.

D They can be autotrophic as they possess chloroplasts.

Q3: The following is a list of the different classes of Protozoa:

1. Sarcodina
2. Ciliophora
3. Flagellata
4. Sporozoa

A single-celled eukaryotic organism is found that possesses a foot-like extension to aid its movement. Which of the classes listed is this organism most likely to belong to?

A Sporozoa

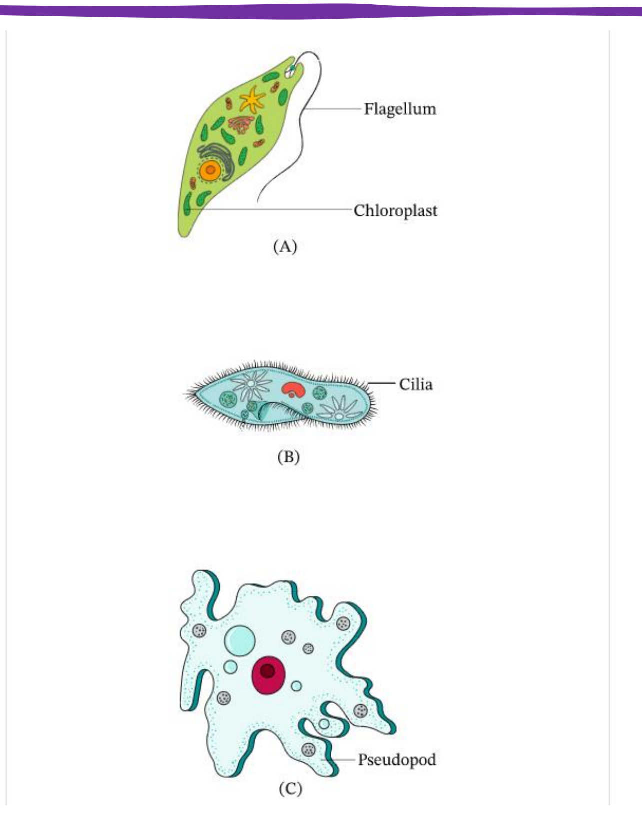
B Sarcodina

C Ciliophora

D Flagellata

Q4: Phylum Euglenophyta belongs to the kingdom Protista.

Choose from the following protists the organism that belongs to this phylum and justify your answer.



A Organism (B) because it is a heterotrophic unicellular organism that uses cilia for locomotion

B Organism (C) because it is a heterotrophic unicellular organism that uses pseudopodia for locomotion

C Both organisms (B) and (C) because they do not contain chloroplasts

D Organism (A) because it is an autotrophic unicellular organism that uses flagella for locomotion

Q5: The kingdom Protista is divided into multiple phyla.

Which of the following statements best describes organisms belonging to the Chrysophyta phylum?

A Organisms are unicellular, they inhabit fresh water or salt water, and most contain chloroplasts to carry out photosynthesis.

B Organisms move by the use of flagella, their cells contain photosynthetic pigments, and nearly all species are classed as phytoplankton.

C Organisms are mostly unicellular algae, with their cells often containing chloroplasts and the cell walls containing silica.

D Organisms are unicellular, they often inhabit water or moist soils, and they can act as parasites.

Q6: The kingdom Protista is divided into multiple phyla.

Which of the following statements best describes organisms belonging to the Euglenophyta phylum?

A Organisms are unicellular, they inhabit fresh water or salt water, and most contain chloroplasts to carry out photosynthesis.

B Organisms move by the use of cilia, and they often predate on smaller protists.

C Organisms are mostly unicellular algae, with their cells often containing chloroplasts and the cell walls containing silica.

D Organisms are unicellular, and they are often found living as parasites on the skin of large animals.

Q7: The following is a list of the different classes of protozoa:

1. Sarcodina
2. Ciliophora
3. Flagellata
4. Sporozoa

A eukaryotic organism is found that possesses two long appendages from its cells, which move in a whip-like movement to propel it forward. Which of the classes listed is this organism most likely to belong to?

A Flagellata

B Sarcodina

C Sporozoa

D Ciliophora

Q8: Which of the following is **not** true about ciliates (Ciliophora)?

A Ciliates are protozoans that are characterised by the presence of hairlike organelles.

B Ciliates are protozoans that are characterised by having a single long flagellum.

C Ciliates are protozoans that do not possess pseudopodia.

D Ciliates are protozoans that move by the means of cilia.

Q9: The following is a list of the different classes of Protozoa:

1. Sarcodina
2. Ciliophora
3. Flagellata
4. Sporozoa

A single-celled eukaryotic organism is found that is propelled through water by hundreds of tiny membrane extensions that beat simultaneously. Which of the classes listed is this organism most likely to belong to?

A Ciliophora

B Flagellata

C Sporozoa

D Sarcodina

Q10: The following is a list of the different classes of protozoa:
1. Sarcodina
2. Ciliophora
3. Flagellata
4. Sporozoa

A single-celled eukaryotic organism is found that has no notable specialized appendages for movement and can live as a parasite on other organisms. Which of the classes listed is this organism most likely to belong to?

A Ciliophora

B Sarcodina

C Sporozoa

D Flagellata

Q11: The picture provided shows *Amoeba proteus*, an organism belonging to the kingdom Protista.

Which of the following statements describes the characteristics of organisms belonging to the kingdom Protista?



A Organisms are eukaryotic, they contain membrane-bound organelles like a nucleus, and the majority are unicellular.

B Organisms are prokaryotic, autotrophic, and multicellular.

C Organisms are prokaryotic, so they do not contain a membrane-bound nucleus, and they are all unicellular.

D Organisms are eukaryotic, they all contain photosynthetic pigments, and the majority are multicellular.

Q12: Organisms belonging to the kingdom Protista are eukaryotic. Which of the following best explains what this means?

A The cells of the organism contain the majority of their genetic material in multiple plasmids.

B The cells of the organism contain the majority of their genetic material in a single-looped chromosome.

C The cells of the organism contain the majority of their genetic material in a membrane-bound nucleus.

D The cells of the organism do not contain any genetic material.

Q13: The kingdom Protista is divided into multiple phyla.

Which of the following statements best describes organisms belonging to the Pyrrophyta phylum?

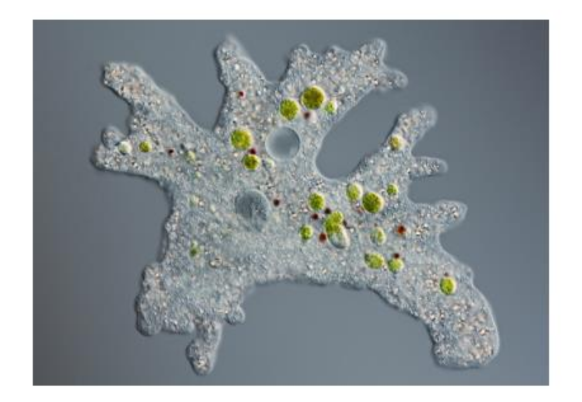
A Organisms are mostly unicellular algae, with their cells often containing chloroplasts and the cell walls containing silica.

B Organisms move by the use of flagella, their cells contain photosynthetic pigments, and nearly all species are classed as phytoplankton.

C Organisms are unicellular, they often inhabit water or moist soils, and they can act as parasites.

D Organisms are unicellular, they inhabit fresh water or salt water, and most contain chloroplasts to carry out photosynthesis.

Q14: The picture provided shows an organism belonging to the Protozoa phylum of kingdom Protista. Which of the following statements best describes the characteristics of organisms belonging to this phylum?



A Organisms are unicellular, live in areas with high plant density, and are autotrophic.

B Organisms can be multicellular or unicellular and are all parasitic, so they live on the bodies of other organisms.

C Organisms are mostly unicellular, commonly live in moist soil or water, and are heterotrophic.

D Organisms are multicellular, live only on land, and are heterotrophic.

Q15: A parasitologist examining a blood sample found out a parasite belonging to phylum Protozoa that parasitises humans and infects them with sleeping sickness. What is the name of this parasite?

A *Plasmodium*

B *Amoeba*

C *Trypanosoma*

D *Paramecium*

Q16: Which of the following tables correctly outlines the different classes of the Protozoa phylum, their defining methods of movement, and an example genus for each?

- A

Class	Method of Movement	Example Genus
Sarcodina	Move by cilia that surround the cell	*Amoeba*
Ciliophora	Move by temporary extensions called pseudopodia	*Paramecium*
Flagellata	Move by flagella attached to the cell	*Trypanosoma*
Sporozoa	Do not possess specialized features for movement but are able to glide	*Plasmodium*

- B

Class	Method of Movement	Example Genus
Sarcodina	Do not possess specialized features for movement but are able to glide	*Trypanosoma*
Ciliophora	Move by cilia that surround the cell	*Plasmodium*
Flagellata	Move by flagella attached to the cell	*Paramecium*
Sporozoa	Move by temporary extensions called pseudopodia	*Amoeba*

- C

Class	Method of Movement	Example Genus
Sarcodina	Move by temporary extensions called pseudopodia	*Amoeba*
Ciliophora	Move by cilia that surround the cell	*Paramecium*
Flagellata	Move by flagella attached to the cell	*Trypanosoma*
Sporozoa	Do not possess specialized features for movement but are able to glide	*Plasmodium*

- D

Class	Method of Movement	Example Genus
Sarcodina	Do not possess specialized features for movement but are able to glide	*Amoeba*
Ciliophora	Move by cilia that surround the cell	*Paramecium*
Flagellata	Move by flagella attached to the cell	*Trypanosoma*
Sporozoa	Move by temporary extensions called pseudopodia	*Plasmodium*

Q17: Which of the following statements is correct about organisms belonging to kingdom Protista?

A They are all unicellular.

B They can be unicellular or multicellular.

C They are all multicellular.

Q18: How do protozoa reproduce?

A Protozoa can reproduce by budding only.

B Protozoa can reproduce asexually by fission only.

C Protozoa can reproduce both sexually and asexually.

D Protozoa can reproduce sexually only.

Q19: Kingdom Protista is divided into multiple phyla. Which of the following is **not** a phylum of kingdom Protista?

A Chrysophyta

B Protozoa

C Bryophyta

D Euglenophyta

E Pyrrophyta

Q20: Which of the following statements about the nutrition of the organisms of the kingdom Protista is correct?

A Organisms belonging to this kingdom are exclusively heterotrophic.

B Organisms belonging to this kingdom are exclusively autotrophic.

C Organisms belonging to this kingdom can be autotrophic or heterotrophic.

Q21: Which of the following lists states the classes of the Protozoa phylum?

A Flagellata, Zygomycota, Ascomycota, and Basidiomycota

B Sarcodina, Ciliophora, Flagellata, and Sporozoa

C Ciliophora, Rhodophyta, Chlorophyta, and Tracheophyta

D Sporozoa, Archaebacteria, and Eubacteria

Q22: Which of the following organisms have cell walls made of silica?

A Yeasts

B Dinoflagellates

C Moulds

D Diatoms

Guide Answer:

1	A	11	A	21	B
2	D	12	C	22	D
3	B	13	B		
4	D	14	C		
5	C	15	C		
6	A	16	C		
7	A	17	B		
8	B	18	C		
9	A	19	C		
10	C	20	C		

Q1: Which of the following best describes members of kingdom Fungi?

A They are heterotrophic organisms which are only parasitic and have no cell walls.

B They are free-living heterotrophic organisms which have no cell walls and reproduce by binary fission.

C They are mobile heterotrophic organisms which may be parasitic or saprophytic and have cell walls.

D They are heterotrophic organisms which may be parasitic or saprophytic and have cell walls.

Q2: For the following statements about organisms in kingdom Fungi, state whether they are true or false.

- Organisms belonging to kingdom Fungi can photosynthesize to produce their own nutrition.

A False

B True

- Organisms belonging to kingdom Fungi may be able to form spores sexually or asexually.

A False

B True

- Organisms belonging to kingdom Fungi may be unicellular or multicellular.

A True

B False

Q3: Which of the following genera includes organisms that are commonly known as black bread mold?

A *Rhizopus*

B *Penicillium*

C *Fusarium*

D *Aspergillus*

Q4: Which of the following organisms **cannot** perform photosynthesis?

A *Funaria*

B *Euglena*

C *Nostoc bacteria*

D *Rhizopus nigricans*

Q5: Which of the following statements is true of the members of the genus *Penicillium*?

A They belong to the phylum Ascomycota.

B They have the ability to reproduce by spores.

C Some of them can produce antibiotics.

D All the answers are correct.

Q6: A list of phyla belonging to kingdom Fungi is provided:

1. Zygomycota
2. Ascomycota
3. Basidiomycota

An organism is found that has divided hyphae and that produces spores by sexual and asexual reproduction inside a sac-like structure. Which phylum of Fungi provided is it most likely to belong to?

A Basidiomycota

B Zygomycota

C Ascomycota

Q7: A list of phyla belonging to kingdom Fungi is provided:

1. Zygomycota
2. Ascomycota
3. Basidiomycota

An organism is found that has undivided hyphae and that produces spores asexually inside sporangia. Which phylum of Fungi provided is it most likely to belong to?

A Ascomycota

B Basidiomycota

C Zygomycota

Q8: A list of phyla belonging to the kingdom Fungi is provided:

1. Zygomycota
2. Ascomycota
3. Basidiomycota

An organism is found that has divided hyphae and that produces spores by sexual reproduction on a club-shaped structure. Which phylum of Fungi is it most likely to belong to?

A Ascomycota

B Zygomycota

C Basidiomycota

Q9: What are the spore-producing structures found in the gills of a mushroom?

A Asci

B Sporangia

C Mycelia

D Basidia

Q10: The Venn diagram provided shows some key characteristics of the phyla of kingdom Fungi. What other characteristic is shared by all members of the fungi kingdom?

A Cytoplasm containing chloroplasts

B Being parasitic

C Cell membrane containing peptidoglycan

D Being immobile

E Being mobile

Q11: The kingdom Fungi can be divided into multiple phyla, which is done based on the differences between their reproductive structures. Three of these phyla are Zygomycota, Ascomycota, and Basidiomycota.

Which of the following tables correctly describes the characteristics of these phyla, with a correct example organism for each?

- A

Phylum	Characteristics	Example
Basidiomycota	They have undivided hyphae. Spores are produced inside sporangia, mostly by asexual reproduction.	*Rhizopus* (bread mold)
Ascomycota	They have divided hyphae. Spores are produced inside sacs called	*Penicillium*

	asci by sexual and asexual reproduction.	
Zygomycota	They have divided hyphae. Spores are produced inside club-shaped cells called basidia, mostly by sexual reproduction.	Common mushroom

- B

Phylum	Characteristics	Example
Ascomycota	They have undivided hyphae. Spores are produced inside sporangia, mostly by asexual reproduction.	*Rhizopus* (bread mold)
Zygomycota	They have divided hyphae. Spores are produced inside sacs called asci by sexual and asexual reproduction.	*Penicillium*
Basidiomycota	They have divided hyphae. Spores are produced inside club-shaped cells called basidia, mostly by sexual reproduction.	Common mushroom

- C

Phylum	Characteristics	Example
Zygomycota	They have undivided hyphae. Spores are produced inside sporangia, mostly by asexual reproduction.	*Rhizopus* (bread mold)
Ascomycota	They have divided hyphae. Spores are produced inside sacs called asci by sexual and asexual reproduction.	*Penicillium*
Basidiomycota	They have divided hyphae. Spores are produced inside club-shaped cells called basidia, mostly by sexual reproduction.	Common mushroom

- D

Phylum	Characteristics	Example
Ascomycota	They have undivided hyphae. Spores are produced inside sporangia, mostly by asexual reproduction.	*Rhizopus* (bread mold)
Basidiomycota	They have divided hyphae. Spores are produced inside sacs called asci by sexual and asexual reproduction.	*Penicillium*
Zygomycota	They have divided hyphae. Spores are produced inside club-shaped cells called basidia, mostly by sexual reproduction.	Common mushroom

Q12: Which of the following organisms would be classified into kingdom Fungi?

A Bamboo

B Insects

C Yeast

D Slime molds

Q13: Organisms belonging to kingdom Fungi can reproduce sexually or asexually. What reproductive, haploid cells are produced by asexual or sexual reproduction in fungi?

A Ova

B Buds

C Sperm

D Spores

Q14: The picture provided shows an organism belonging to the kingdom Fungi. Which of the following statements describes the characteristics of organisms belonging to this kingdom?



A Organisms are eukaryotic and autotrophic, and some are mobile.

B Organisms are eukaryotic, heterotrophic, and immobile.

C Organisms are prokaryotic, exclusively multicellular, and immobile.

D Organisms are prokaryotic, autotrophic, and mobile.

Q15: Which of the following correctly lists the phyla of kingdom Fungi?

A Sarcodina, Ciliophora, and Flagellata

B Zygomycota, Ascomycota, and Basidiomycota

C Annelida, Nematoda, and Platyhelminthes

D Rhodophyta, Chlorophyta, and Tracheophyta

Q16: Organisms belonging to kingdom Fungi are eukaryotic. Which of the following best explains what this means?

A Their cells have the majority of their genetic material contained in a membrane-bound nucleus.

B Their cells have the majority of their genetic material freely moving within the cytoplasm.

C Their cells have the majority of their genetic material contained in a single chromosome loop.

D Their cells have the majority of their genetic material contained in a plasmid.

Q17: Many types of mushrooms are safe for human consumption. The following picture shows some types of those edible mushrooms. Which of the following is correct about classification of mushrooms?

A Mushrooms and bread moulds are different species which share the same genus.

B Mushrooms are a type of fungus belonging to the division Basidiomycota because they produce spores inside a club-shaped structure called a basidium.

C Mushrooms are a type of fungus belonging to the division Ascomycota because they produce spores inside sac-like structures called asci.

D Mushrooms are a type of vegetable belonging to the class Gymnospermae because they use spores instead of flowers for reproduction.

Q18: Organisms belonging to kingdom Fungi are heterotrophic. How do the majority of organisms in the kingdom Fungi obtain their nutrition?

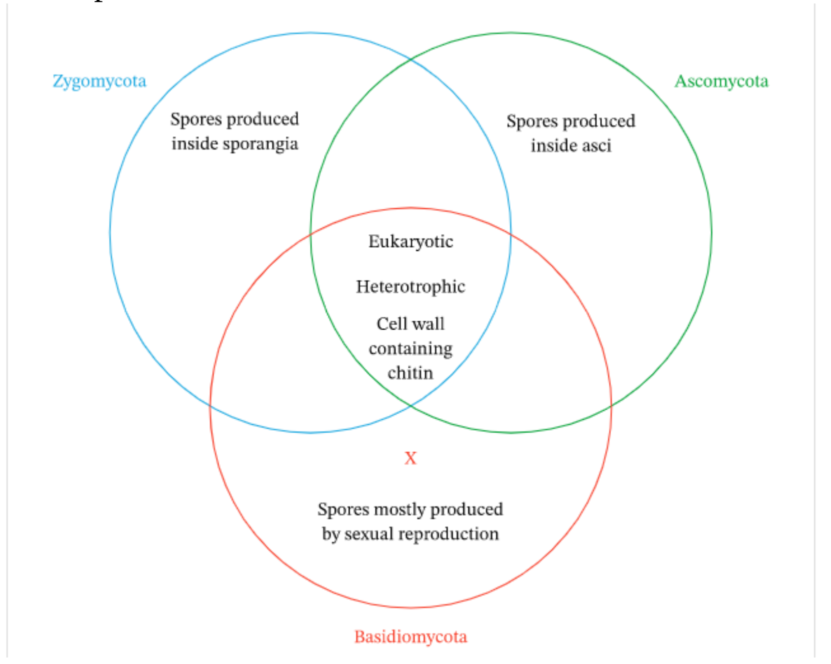
A They absorb nutrients from organic matter in their environment, such as dead tissues.

B They produce it themselves through the process of photosynthesis.

C They act as parasites and enter the bloodstream of animals to obtain nutrients.

D They ingest and digest other organisms, obtaining nutrients from the breakdown of their tissues.

Q19: The Venn diagram provided shows some key characteristics of the phyla of kingdom Fungi. What characteristic could replace X?



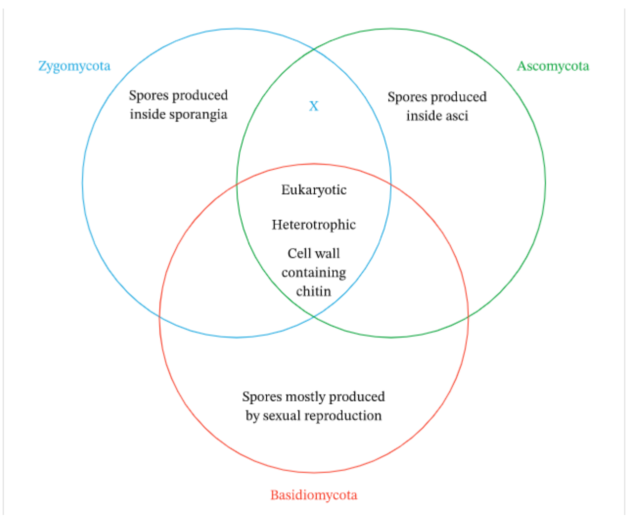
A Spores produced on basidia

B Spores produced inside ovules

C Contains membrane-bound chloroplasts

D Replicates by binary fission

Q20: The Venn diagram provided shows some key characteristics of the phyla of kingdom Fungi. What characteristic could replace X?



A	Spores produced by asexual reproduction only
B	Cell membrane containing peptidoglycan
C	Reproducing by binary fission
D	Reproducing by regeneration
E	Spores produced by asexual or sexual reproduction

Guide Answer:

1	D	11	C
2	A,B,A	12	C
3	A	13	D
4	D	14	B
5	D	15	B
6	C	16	A
7	C	17	B
8	C	18	A
9	D	19	A
10	D	20	E

Q1: Which of the following is **not** a class of the phylum Tracheophyta?

A Filicatae (ferns)

B Gymnospermae (conifers)

C Angiospermae (flowering plants)

D Rhodophyta (red algae)

Q2: A flower with a long stem that contains a specialized system for transporting water and sugars has been found.

What phylum, Bryophyta or Tracheophyta, is this plant most likely to belong to?

A Tracheophyta

B Bryophyta

Q3: Organisms in the kingdom Plantae can be further classified based on their characteristics (for instance, whether they possess flowers or whether they are vascular or nonvascular).

Which of the following statements correctly describes the difference between vascular and nonvascular plants?

A Vascular plants have distinct, specialized structures to transport food, minerals, and water, whereas nonvascular plants do not.

B Nonvascular plants have distinct, specialized structures to transport food, minerals, and water, whereas vascular plants do not.

Q4: In kingdom Plantae, the organisms that have -------------- are considered more advanced.

A rhizoids

B a spore sac

C a cell wall

D a dedicated vascular system

Q5: A plant has been found that has vascular tissues scattered throughout the stem and has narrow leaves with parallel veins. Which class of angiosperms (monocotyledons or dicotyledons) is it most likely to belong to?

A Dicotyledons

B Monocotyledons

Q6: The picture provided shows a rose plant, which is a dicotyledon. Which of the following is the correct order of taxonomic classification, from largest to smallest, for the rose plant?



A Plantae, Tracheophyta, Angiospermae, dicotyledons

B Plantae, Angiospermae, dicotyledons, Tracheophyta

C Plantae, Angiospermae, Tracheophyta, dicotyledons

D Dicotyledons, Plantae, Tracheophyta, Angiospermae

Q7: A scientist makes the following observations about a plant

The leaves are long and thin.

The leaves have parallel veins.

The flower has 6 petals.

There are many branching roots.

Is this plant likely to be a dicot or a monocot?

A Dicot

B Monocot

Q8: A plant is found that has vascular tissues arranged in a ring in the stem, and has broad leaves with a network of veins. Which class of angiosperms (monocotyledons or dicotyledons) is it most likely to belong to?

A Dicotyledons

B Monocotyledons

Q9: Organisms belonging to the kingdom Plantae are autotrophic. Which of the following best explains what this means?

A Autotrophic organisms are able to grow in nutrient-free environments.

B Autotrophic organisms can produce their own food using inorganic materials.

C Autotrophic organisms obtain their food through consuming other organisms.

Q10: The picture provided shows a bamboo plant, which is a monocotyledon. Which of the following is the correct order of taxonomic classification, from largest to smallest, for the bamboo plant?



A Plantae, Tracheophyta, Angiospermae, monocotyledons

B Tracheophyta, Plantae, Angiospermae, monocotyledons

C Monocotyledons, Plantae, Tracheophyta, Angiospermae

D Plantae, Angiospermae, Tracheophyta, monocotyledons

Q11: Some classification systems arrange organisms in the kingdom Plantae into higher algae, vascular plants, and nonvascular plants.

Which of the following tables correctly summarizes the characteristics of some of the phyla belonging to these groups?

- A

Phylum	Chlorophyta	Phaeophyta	Rhodophyta	Tracheophyta	Bryophyta
Characteristics	Marine organisms containing red pigments	Marine organisms containing brown pigments	Algae that contain chlorophyll as the primary pigment in their chloroplasts	Nonvascular plants that inhabit damp and shaded habitats	Vascular plants that contain specialized tissues for transport

- B

Phylum	Rhodophyta	Phaeophyta	Chlorophyta	Bryophyta	Tracheophyta
Characteristics	Marine organisms containing red pigments	Marine organisms containing brown pigments	Algae that contain chlorophyll as the primary	Nonvascular plants that inhabit damp and shaded habitats	Vascular plants that contain specialized

			pigment in their chloroplasts		tissues for transport

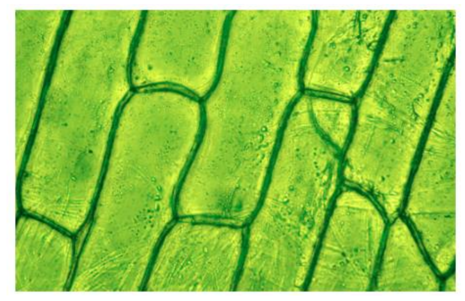
- C

Phylum	Tracheophyta	Rhodophyta	Phaeophyta	Chlorophyta	Bryophyta
Characteristics	Marine organisms containing red pigments	Marine organisms containing brown pigments	Algae that contain chlorophyll as the primary pigment in their chloroplasts	Nonvascular plants that inhabit damp and shaded habitats	Vascular plants that contain specialized tissues for transport

- D

Phylum	Rhodophyta	Bryophyta	Phaeophyta	Chlorophyta	Tracheophyta
Characteristics	Marine organisms containing red pigments	Marine organisms containing brown pigments	Algae that contain chlorophyll as the primary pigment in their chloroplasts	Nonvascular plants that inhabit damp and shaded habitats	Vascular plants that contain specialized tissues for transport

Q12: The picture shows the cells of an organism belonging to the kingdom Plantae under a microscope. The walls surrounding the cells are visible. What is the main component of these walls?



A Chitin

B Cellulose

C Peptidoglycan

D Glucose

Q13: Which of the following is **not** a common characteristic between *Funaria* and *Riccia*?

A Both of them live in damp soil.

B Both of them have rhizoids.

C Both of them belong to the phylum Bryophyta.

D Both of them are flat in shape.

Q14: Which of the following is a shared characteristic of ferns and conifers?

A Their leaves have the same morphological features.

B They reproduce asexually by spores.

C They do not form flowers.

D They do not produce seeds.

Q15: Angiosperms (flowering plants) can be further classified into two groups, monocotyledons and dicotyledons. Which of the following statements correctly describes a major difference between monocotyledons and dicotyledons?

A Dicotyledons have their vascular tissues scattered throughout the stem, whereas monocotyledons have their vascular tissues arranged in a ring in the stem.

B Monocotyledons have their vascular tissues scattered throughout the stem, whereas dicotyledons have their vascular tissues arranged in a ring in the stem.

Q16:



Which of the following is true about the plants in the same class that the plant in the figure belongs to?

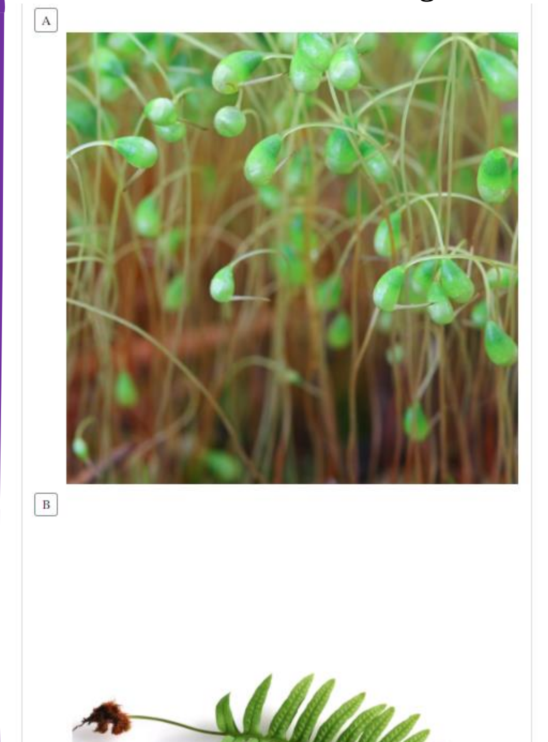
A They carry male and female cones.

B They do not have seeds.

C They have seeds that are enclosed in a fruit.

D They produce flowers.

Q17: Which of the following is a vascular plant?





Q18: A plant that has no vascular tissue and that inhabits the dark, moist parts of woodland has been found.

Which phylum, Bryophyta or Tracheophyta, is this plant most likely to belong to?

A Tracheophyta

B Bryophyta

Q19: The picture provided shows an organism belonging to the kingdom Plantae. What are the characteristics of organisms belonging to this kingdom?



A These organisms are eukaryotic, multicellular, and heterotrophic.

B These organisms are prokaryotic, multicellular, and autotrophic.

C These organisms are prokaryotic, multicellular, and heterotrophic.

D These organisms are eukaryotic, multicellular, and autotrophic

Q20: Which of the following organisms would **not** be classified into the kingdom Plantae?

A Yeast

B Conifer

C Fern

D Moss

Q21: Organisms belonging to the kingdom Plantae are eukaryotic. Which of the following best explains what this means?

A Their cells contain the majority of their genetic material in a single circular chromosome.

B Their cells contain the majority of their genetic material in plasmids.

C Their cells contain the majority of their genetic material in a membrane-bound nucleus.

D Their cells contain the majority of their genetic material in the cytoplasm.

Q22: What is the difference between gymnosperms and angiosperms?

A Gymnosperms belong to phylum Tracheophyta, while angiosperms belong to phylum Bryophyta.

B Gymnosperms are dicotyledons, while angiosperms are monocotyledons.

C Gymnosperms are non-flowering plants, while angiosperms are flowering plants.

D Gymnosperms are vascular plants, while angiosperms are non-vascular plants.

Guide Answer:

1	D	11	B	21	C
2	A	12	B	22	C
3	A	13	D		
4	D	14	C		
5	B	15	B		
6	A	16	A		
7	B	17	B		
8	A	18	B		
9	B	19	D		
10	A	20	A		

Q1: Fill in the blank: An octopus (pictured) is an invertebrate, so it does not have --------------.

A specialized sex organs
B a backbone
C a specialized nervous system
D a circulatory system
E the ability to reproduce

Q2: Which of the following is **not** a common characteristic of most organisms belonging to the Animalia kingdom?

A They are autotrophic.
B They are mobile.
C They are multicellular.
D They are eukaryotic.

Q3: The following is a list of organisms and some of their key features:

A. A hydra, which possesses stinging cells (cnidocytes)
B. An anemone, which has a single opening surrounded by tentacles
C. A tapeworm, which has a flat and bilaterally symmetrical body
D. An earthworm, which has a segmented bilaterally symmetrical body
E. A spider, which has a body divided into two major regions
F. A sea urchin, which possesses tube feet for movement

State the letters corresponding to the two organisms that belong to the same phylum.

A B and F
B B and C
C A and F
D C and D
E A and B

Q4: Which of the following organisms belongs to the phylum Mollusca?

A Starfish
B Shark
C Snail
D Sea urchin

Q5: All living organisms classified under the phylum Arthropoda have --------------.

A a bilateral symmetrical body
B three pairs of legs
C simple eyes
D gills

Q6: Which of the following organisms is known for having cnidocytes for catching prey?

A The sea anemone
B Planarian
C Sponges
D Bilharzia

Q7: Which of the following is **not** a typical characteristic of a roundworm (nematode)?

A Organisms are hermaphroditic.
B Organisms have a bilaterally symmetrical body.
C Organisms have a cylindrical body.
D Organisms have a body consisting of three layers.

Q8: Which of the following is **not** a typical characteristic of a flatworm (platyhelminth)?

A Having a bilaterally symmetrical body
B Having a flattened body and a head
C Having a body divided into distinct segments
D Having a body composed of three layers

Q9: A scientist makes the following notes on an aquatic organism:

1. Has a soft body
2. No obvious exoskeleton
3. Absence of segmentation
4. Visible and distinct head

Which invertebrate phylum is this organism most likely to belong to?

A Echinodermata
B Cnidaria
C Porifera
D Arthropoda
E Mollusca

Q10: A scientist makes the following notes on an aquatic organism:

1. Radial symmetry
2. Oral and aboral surface
3. Tube feet present

Which invertebrate phylum does this organism most likely belong to?

A Annelida
B Echinodermata
C Nematoda
D Mollusca
E Cnidaria

Q11: A passage on the characteristics of organisms belonging to the phylum Mollusca is provided:

Organisms belonging to the phylum Mollusca have an body that has a calcareous .

- Which word would be most appropriate to replace the first blank?

A Undifferentiated
B Unspecialized
C Asymmetrical
D Unsegmented

- Which word would be most appropriate to replace the second blank?

A Shell
B Cell wall
C Appendage
D Skin

Q12: Which of the following is a characteristic of a segmented worm (annelid)?

A Having a body containing a developed vertebral column
B Not having a nervous system
C Having a body divided into distinct rings or sections
D Having an exoskeleton that is divided into distinct segments

Q13: Although both the sea anemone and the sea cucumber are marine invertebrates that do not have heads, they are classified in different phyla. Which of the following best describes the distinctive characteristics of both organisms?

A The sea cucumber has a tongue-like organ called the radula, while the sea anemone's mouth is surrounded by numerous tentacles.
B The sea anemone has a mouth surrounded by sucker-like structures called tube feet, while the sea cucumber has spine-like structures called chaetae that are buried in their skin to help them move.
C The sea anemone has two surfaces, oral and aboral, with the mouth located on the oral surface, while the sea cucumber has a gastrovascular cavity with a mouth surrounded by tentacles.
D The sea cucumber has a hard endoskeleton and tube feet used for locomotion, while the sea anemone has stinging cells called cnidocytes for self-defense and capturing the prey.

Q14: Which of the following tables correctly summarizes the different phyla of worms and their defining characteristics?

- A

Phylum	Platyhelminthes	Nematoda	Annelida
Characteristics	Cylindrical bodies, either male or female	Flattened bodies, usually hermaphrodites	Segmented bodies, can be hermaphrodites or either male or female

- B

Phylum	Platyhelminthes	Nematoda	Annelida
Characteristics	Flattened bodies, usually hermaphrodites	Cylindrical bodies, either male or female	Segmented bodies, can be hermaphrodites or either male or female

- C

Phylum	Platyhelminthes	Nematoda	Annelida
Characteristics	Cylindrical bodies, either male or female	Segmented bodies, can be hermaphrodites or either male or female	Flattened bodies, usually hermaphrodites

- D

Phylum	Platyhelminthes	Nematoda	Annelida
Characteristics	Segmented bodies, can be hermaphrodites or either male or female	Cylindrical bodies, either male or female	Flattened bodies, usually hermaphrodites

Q15: Sea anemones belong to the phylum Cnidaria. What defining characteristics do organisms belonging to this phylum share?



A These organisms only respire anaerobically, and they can live on land or in the sea.

B Their bodies consist of two main layers of cells, they do not possess a head, and they have a mouth surrounded by tentacles.

C Their bodies are segmented, with each segment attached to appendages, and they do not possess a head.

D Their bodies consist of three main layers of cells and are often surrounded by a hard exoskeleton.

Q16: The picture provided shows a member of the Porifera phylum, more commonly known as sponges. Sponges are immobile, but are still classified into the kingdom Animalia. Which characteristics do they share with the rest of the animal kingdom?



- A They are unicellular and reproduce sexually.
- B They are eukaryotic and reproduce asexually.
- C They are multicellular and autotrophic.
- D They are multicellular and heterotrophic.

Q17: Which of the following is **not** a class of the Arthropoda phylum?

- A Crustacea
- B Annelida
- C Arachnida
- D Myriapoda
- E Insecta

Q18: An unknown species of worm has been discovered. The body is cylindrical and bilaterally symmetrical. The organism found is determined to be a male. What phylum (Platyhelminthes, Nematoda, or Annelida) is this worm most likely to belong to?

- A Nematoda
- B Platyhelminthes
- C Annelida

Q19: Which of the following organisms belongs to the phylum Echinodermata?

- A Oyster
- B Snail
- C Octopus
- D Starfish

Q20: One of the differences between insects and arachnids is that arachnids have eight legs, while insects have six legs. What taxonomic level or levels do they both share?

A Kingdom only
B Phylum and class only
C Kingdom, phylum, and class
D Kingdom and phylum

Q21: Which of the following tables correctly links the classes of Arthropoda to their defining features and example organisms?

- A

Class	Features	Example Organism
Arachnida	The body is divided into three regions, with each region having appendages like legs or antennae.	Crab
Insecta	The body is divided into three regions, with three pairs of legs and one pair of antennae.	Locust
Crustacea	The body is divided into two regions, with four pairs of legs and no antennae or wings.	Spider

- B

Class	Features	Example Organism
Arachnida	The body is divided into three segments, with each segment having appendages like legs or antennae.	Locust
Crustacea	The body is divided into three segments, with three pairs of legs and one pair of antennae.	Crab
Insecta	The body is divided into two segments, with four pairs of legs and no antennae or wings.	Spider

- C

Class	Features	Example Organism

Crustacea	The body is divided into three regions, with each region having appendages like legs or antennae.	Spider
Arachnida	The body is divided into three regions, with three pairs of legs and one pair of antennae.	Locust
Insecta	The body is divided into two regions, with four pairs of legs and no antennae or wings.	Crab

- D

Class	Features	Example Organism
Crustacea	The body is divided into three regions, with each region having appendages like legs or antennae.	Crab
Insecta	The body is divided into three regions, with three pairs of legs and one pair of antennae.	Locust
Arachnida	The body is divided into two regions, with four pairs of legs and no antennae or wings.	Spider

Q22: Which of the following statements correctly describes the main difference between invertebrates and vertebrates?

A Invertebrates do not have a backbone, whereas vertebrates do.
B Vertebrates have an exoskeleton, whereas invertebrates do not.
C Vertebrates do not have a notochord, whereas invertebrates do.
D Vertebrates do not have a backbone, whereas invertebrates do.

Q23: The following is a statement about the characteristics of organisms belonging to the phylum Echinodermata: Organisms belonging to the phylum Echinodermata have an ----- body and a hard, calcareous ---------- that is covered by a layer of skin.

Which word would be most appropriate to replace the first blank?

A Unspecialized
B Asymmetrical
C Undifferentiated
D Unsegmented

Which word would be most appropriate to replace the second blank?

A Endoskeleton
B Epidermis
C Appendage
D Exoskeleton

Q24: Which of the following is **not** a characteristic of an organism that belongs to the Arthropoda phylum?

A Being immobile
B Having a body divided into segments
C Being covered by an exoskeleton
D Having a bilaterally symmetrical body

Q25: Which of the following characteristics would help distinguish an arthropod from a mollusk?
A The absence of a backbone
B Having a single opening acting as both the mouth and the anus
C The absence of a complex nervous system
D A body divided into distinct segments
E Possessing extensions from the body or appendages

Guide Answer:

1	B	11	D,A	21	D
2	A	12	C	22	A
3	E	13	D	23	D,A
4	C	14	B	24	A
5	A	15	B	25	D
6	A	16	D		
7	A	17	B		
8	C	18	A		
9	E	19	D		
10	B	20	D		

Q1: Which of the following characteristics would help distinguish an organism belonging to order Perissodactyla from an organism belonging to order Artiodactyla?

A Large and pointed canines

B A herbivorous diet

C The absence of hind limbs

D Teeth specialized for grinding

E An odd number of toes

Q2: Which of the following statements describes a characteristic shared by amphibians, reptiles, and birds?

A The females of these organisms produce milk to feed their young.

B These organisms are all covered by scales rather than skin.

C These organisms all give birth to live young.

D These organisms all lay eggs rather than giving birth to live young.

Q3: The class Eutheria is divided into different orders, outlined in the table provided.

Order	Carnivora	Cetacea	Rodentia	Proboscidea	Primates
Characteristics	Large, pointed teeth; sharp claws; has a primary food source of other animals	Aquatic animals with flipper-shaped forelimbs and a horizontal tail fin	Often a small, short body; large front teeth; small ears; some have a long tail	A long, muscular trunk with tusks	Hands and feet have 5 digits, with opposable thumbs on the hand; a large brain relative to body size

Use this table to state the order that the organism in the picture is most likely to belong to.



A Primates

B Proboscidea

C Carnivora

D Rodentia

Q4: An unknown marine organism is discovered. The organism found has a long, thin body that is not covered in scales, and it has no paired fins. What class of vertebrates is this organism most likely to belong to?

A Osteichthyes

B Agnatha

C Chondrichthyes

Q5: Which of the following characteristics would help distinguish an organism belonging to order Cetacea from an organism belonging to order Chiroptera?

A A carnivorous diet

B A primitive circulatory system

C Paddle-like forelimbs

D An even number of toes

E Opposable thumbs

Q6: Which of the following characteristics would help distinguish an organism belonging to order Proboscidea from an organism belonging to order Edentata?

A The presence of large, pointed canines

B The absence of a complex nervous system

C An omnivorous diet

D The presence of a long, muscular trunk

E The number of limbs being less than 4

Q7: Which of the following statements describes a characteristic shared by reptiles, birds, and mammals?

A These organisms are all covered by smooth skin that contains hair.
B The females of these organisms produce milk to feed their young.
C These organisms all breathe through lungs.
D These organisms all give birth to live young.

Q8: Which of the following has a cartilaginous skeleton and breathes through gills?





Q9: Name the subclass of Mammalia that is being described:

These are mammals that often give birth to immature young that must be kept in their mothers' pouches for weeks after birth.

A Prototheria
B Eutheria
C Metatheria

Q10: A scientist makes the following notes on an organism:

1. Has a body covered in scales
2. Uses the environment to regulate body temperature
3. Breathes through lungs

Which class of vertebrates does this organism most likely belong to?

A Aves
B Reptilia
C Agnatha
D Mammalia
E Amphibia

Q11: Which of the following classes is **not** a class of the vertebrata subphylum?

A Amphibia
B Aves
C Mammalia
D Reptilia
E Arthropoda

Q12: What are the three subclasses of the class Mammalia?

A Prototheria, Metatheria, Eutheria
B Metatheria, Eutheria, Protista
C Prototheria, Metatheria, Archaea
D Archaea, Eukarya, Protista

Q13: An unknown marine organism is discovered. The organism has a body covered in scales, paired fins, and a skeleton formed from cartilage. Which class of vertebrates is this organism most likely to belong to?

A Agnatha
B Chondrichthyes
C Osteichthyes

Q14: Organisms belonging to the class Osteichthyes are more commonly known as bony fishes; an example is pictured. Which of the following is **not** a characteristic of an organism in the class Osteichthyes?



A Their bodies are covered in skin.
B They possess an air bladder to help them swim or float.
C Their skeletons are formed from bones.
D They have paired fins.

Q15: The class Eutheria is divided into different orders, outlined in the table provided.

Order	Carnivora	Cetacea	Rodentia	Proboscidea	Primates
Characteristics	Large, pointed teeth; sharp claws; has a primary food source of other animals	Aquatic animals with flipper-shaped forelimbs and a horizontal tail fin	Often a small, short body; large front teeth; small ears; some with a long tail	A long, muscular trunk with tusks	Hands and feet have 5 digits, with opposable thumbs on the hand; a large brain relative to body size

Use this table to state the order that the organism in the picture is most likely to belong to.



A Rodentia
B Carnivora
C Primates
D Proboscidea

Q16: Which of the following best describes the difference in appearance between an amphibian and a reptile?

A Amphibians have bodies covered with smooth skin, while reptiles have bodies covered with dry scales.
B Amphibians have bodies covered with hair or fur, while reptiles have bodies covered with smooth or slimy scales.
C Reptiles have bodies covered with smooth skin, while amphibians have bodies covered with dry scales.

Q17: Organisms belonging to the class Agnatha are commonly known as jawless fish; an example is pictured. Which of the following is **not** a characteristic of an organism in the class Agnatha?



A They have an air bladder to help them float.
B They possess a notochord.
C They have a circular mouth with many teeth.
D They often act as parasites to larger fish.

Q18: A scientist makes the following notes on an organism:

1. Regulates own body temperature
2. Has four pentadactyl limbs
3. Body covered in skin

Which class of vertebrates does this organism most likely belong to?

A Amphibia
B Reptilia
C Mammalia
D Aves
E Chondrichthyes

Q19: The class Eutheria is divided into different orders, outlined in the table provided.

Order	Carnivora	Cetacea	Rodentia	Proboscidea	Primates
Characteristics	Large, pointed teeth; sharp claws; has a primary food source of other animals	Aquatic animals with flipper-shaped forelimbs and a horizontal tail fin	Often a small, short body; large front teeth; small ears; some have a long tail	A long, muscular trunk with tusks	Hands and feet have 5 digits, with opposable thumbs on the hand; a large brain relative to body size

Use this table to state the order that the organism in the picture is most likely to belong to.



A Primates
B Proboscidea
C Rodentia
D Carnivora

Q20: Most organisms belonging to the class Chondrichthyes are marine fishes; an example is pictured. Which of the following is **not** a characteristic of an organism in the class Chondrichthyes?



A Their bodies are covered with scales.
B They have a circular mouth with many teeth.
C They have a body with paired fins.

D Their skeletons are formed from cartilage rather than bones.

E They have gills for gas exchange.

Q21: Which of the following is a defining feature of all organisms belonging to the Chordata phylum?

A The organism will develop multiple external limbs.

B At some stage in its development, the organism will possess a notochord.

C The organism will develop a spinal cord and backbone.

D At some stage in its development, the organism will possess an exoskeleton.

Q22:

The following is a list of mammals and some of their key features:

a. A domestic sheep, with two toes on its feet
b. A capybara, with clawed toes
c. A gibbon, with opposable thumbs
d. A zebra, with a single toe covered by a hoof
e. A rhino, with three toes on its feet

State the letters corresponding to the two mammals that belong to the same order.

A B and D

B D and E

C A and E

D B and C

E A and D

Q23: Name the subclass of Mammalia that is being described:

These are mammals that lay eggs and provide milk for their young via mammary glands.

A Eutheria

B Prototheria

C Metatheria

Q24: An unknown marine organism is discovered. The organism found has a body covered in scales and has paired fins and a bony skeleton. What class of vertebrates is this organism most likely to belong to?

A Agnatha

B Osteichthyes

C Chondrichthyes

Q25: Which of the following is a defining feature of an animal belonging to the vertebrate subphylum?

A The animal has a segmented body.

B The animal develops a backbone or spine.

C The animal develops an external skeleton.

D The animal uses the environment to regulate their own temperature.

Guide Answer:

1	E	11	E	21	B
2	D	12	A	22	B
3	A	13	B	23	B
4	B	14	A	24	B
5	C	15	D	25	B
6	D	16	A		
7	C	17	A		
8	B	18	C		
9	C	19	C		
10	B	20	B		